

This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Minor, Municipal permit. The discharge results from the operation of a 0.016 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the current Virginia WQS (effective January 6, 2011) and updating permit language as appropriate. The effluent limitations and special conditions contained in this permit will maintain the Water Quality Standards of 9VAC25-260 et seq.

1. Facility Name and Mailing Address: North Spring Behavioral Healthcare WWTP  
42009 Victory Lane  
Leesburg, VA 20176  
SIC Code : 4952 WWTP  
8063 Psychiatric Hospital  
  
Facility Location: 42009 Victory Lane  
Leesburg, VA 20176  
County: Loudoun  
  
Facility Contact Name: Mr. David Winters  
Telephone Number: 703-777-0800  
  
Facility E-mail Address: David.winters@uhsinc.com
2. Permit No.: VA0067938  
Expiration Date of previous permit: 8/3/2016  
  
Other VPDES Permits associated with this facility: None  
  
Other Permits associated with this facility: PWSID No. 6107725  
  
E2/E3/E4 Status: NA
3. Owner Name: North Spring Behavioral Healthcare  
Owner Contact/Title: David Winters  
Telephone Number: 703-777-0800  
Owner E-mail Address: Chief Executive Officer
4. Application Complete Date: 4/8/2016  
Permit Drafted By: Anna Westernik  
Date Drafted: 5/13/2016  
Draft Permit Reviewed By: Doug Frasier  
Date Reviewed: 5/17/2016  
Draft Permit Review By: Alison Thompson  
Date Reviewed: 5/26/2016  
Public Comment Period : Start Date: 06/29/2016  
End Date: 07/29/2016
5. Receiving Waters Information: Discharge is to an intermittent stream with a drainage area of < 5 square miles. Hence, it is assumed that critical stream flows are 0.0 MGD. In drafting of this permit, all flows were considered to be 0.0 MGD.  
Receiving Stream Name : Limestone Branch, UT  
Stream Code: 1aXGJ  
Drainage Area at Outfall: 0.0 square miles  
River Mile: 1.33  
Stream Basin: Potomac River  
Subbasin: Potomac  
Section: 8  
Stream Class: III  
Special Standards: PWS  
Waterbody ID: VAN-A03R  
7Q10 Low Flow: 0.0 MGD  
7Q10 High Flow: 0.0 MGD  
1Q10 Low Flow: 0.0 MGD  
1Q10 High Flow: 0.0 MGD  
30Q10 Low Flow: 0.0 MGD  
30Q10 High Flow: 0.0 MGD  
Harmonic Mean Flow: 0.0 MGD  
30Q5 Flow: 0.0 MGD

## 6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

☒ State Water Control Law☐ EPA Guidelines☒ Clean Water Act☒ Water Quality Standards☒ VPDES Permit Regulation☐ Other☒ EPA NPDES Regulation

## 7. Licensed Operator Requirements: Class IV

## 8. Reliability Class: Class I

## 9. Permit Characterization:

☒ Private☒ Effluent Limited☐ Possible Interstate Effect☐ Federal☒ Water Quality Limited☐ Compliance Schedule Required☐ State☐ Whole Effluent Toxicity Program Required☐ Interim Limits in Permit☐ POTW☐ Pretreatment Program Required☐ Interim Limits in Other Document☒ TMDL☒ e-DMR Participant

## 10. Wastewater Sources and Treatment Description:

North Spring Behavioral Healthcare is a 92-bed residential treatment facility serving adolescents with a wastewater treatment plant currently rated at 0.016 MGD. **Attachment 1** is the CTO for the 0.016 MGD design flow rating issued on August 4, 2011. In addition to municipal wastewater, the facility receives filter backwash flow and spent chemical waste from the water treatment plant (see **Attachment 2**). The average flow for the period of September 2011 through March 2016 was 0.012 MGD. Maximum flows exceeded the design flow approximately 46% of the time during this period (see **Attachment 3** for flow values).

Influent municipal flow is conveyed from the facility to the wastewater treatment plant (WWTP) via gravity sewer and two pump stations. The North Spring Behavioral Health Center WWTP process consists of a 4,400 gallon grease trap followed by 4,200 gallon flow equalization (EQ) basin. Submersible, constant-speed influent pumps within the EQ basin discharge to a flow splitter box. The flow splitter box utilizes v-notch and rectangular weirs to discharge a fixed portion of the influent flow to two 4,400 gallon aeration tanks (in series), while the remainder of influent flow is returned to the EQ basin. Flow is then routed to a single clarifier furnished with sludge pumps and air-lift scum skimmer followed by chlorination using sodium hypochlorite and tablet dechlorination.

See **Attachment 4** for a facility schematic/diagram.

TABLE 1 – Outfall Description

OUTFALL NUMBER	DISCHARGE SOURCES	TREATMENT	DESIGN FLOW	Outfall Location Latitude/Longitude
001	Domestic Wastewater from a residential mental health facility	See Item 10 above.	0.016 MGD	39° 08' 56" N 77° 32' 52" W
See <b>Attachment 5</b> for #215A: Waterford Quad.				

**11. Sludge Treatment and Disposal Methods:**

Sludge from this facility is transported to the Broad Run WRF (VA0091383) for stabilization and subsequent disposal via land application or placement in a landfill.

**12. Individual Discharges Permitted in Waterbody VAN-A03R**

TABLE 2 – Individual VPDES Permits Discharging to Waterbody VAN-A03R		
VPDES Permit Number	Facility Name	Receiving Stream
VA0074934	One Stop Trailer Park	Clark's Run
VA0074942	Hiway Mobile Home Community, LLC	Limestone Branch, UT
VA0061280	VICA	Clark's Run
VA0088196	Raspberry Falls WRF	Limestone Branch
VA0021750	Lucketts Elementary School	Limestone Branch, UT

**13. Material Storage:**

TABLE 3 - Material Storage		
Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Dechlorination Tablets (81.3% Sodium Sulfite)	Two five-gallon bucket	Stored in a containment structure
Sodium Hypochlorite 12.5%	15 Gallons	Stored in a containment structure

**14. Site Inspection:**

A technical inspection was conducted by DEQ inspection staff on July 24, 2013 (see **Attachment 6** – Inspection Report).

**15. Receiving Stream Water Quality and Water Quality Standards:****a. Ambient Water Quality Data**

This facility discharges to an unnamed tributary of Limestone Branch (Streamcode XGJ). DEQ Ambient Monitoring Station 1aXGJ000.42 is located at Selma Lane, approximately 0.91 miles downstream from this facility. The following is the water quality summary for this segment of the unnamed tributary to Limestone Branch, as taken from the draft 2014 Integrated Report:

Class III, Section 8, Special Standard. PWS.

DEQ monitoring stations located in this segment of Rapidan River:

- Ambient Water Quality Monitoring Station 1aXGJ000.42 at Selma Lane.

*E. coli* monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. This impairment is nested within the downstream completed bacteria TMDL for Limestone Branch.

The aquatic life and wildlife uses are considered fully supporting. Citizen monitoring had previously noted a medium probability of adverse conditions for biota, resulting in an observed effects for the aquatic life use. The observed effect will remain.

The fish consumption and public water supply uses were not assessed.

## b. 303(d) Listed Stream Segments and Total Maximum Daily Loads (TMDLs)

TABLE 4 – 303 (d) Listed Stream Segments and TMDLs						
Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA	TMDL Schedule
<i>Impairment Information in the Draft 2014 Integrated Report</i>						
Limestone Branch, UT	Recreation	<i>E. coli</i>	Limestone Branch Bacteria EPA Approval: 07/06/2004 (Original TMDL)  03/10/2010 (Modification)	2.79E+10 cfu/year <i>E. coli</i> *	126 cfu/100 ml <i>E. coli</i> 0.016 MGD*	---

\*The WLA is based on a modification to the TMDL to account for a revised design flow for this facility of 0.016 MGD. The original TMDL document provided a WLA of 1.74E+10 cfu/100 ml *E. coli* bacteria based on the facility's original design flow of 0.01 MGD.

This facility discharges to an unnamed tributary to Limestone Branch within the Chesapeake Bay watershed. The receiving stream has been identified in the Chesapeake Bay TMDL; approved by the Environmental Protection Agency (EPA) on December 29, 2010. The TMDL addresses dissolved oxygen (D.O.), chlorophyll a and submerged aquatic vegetation (SAV) impairments in the main stem Chesapeake Bay and its tributaries by establishing nonpoint source load allocations (LAs) and point source wasteload allocations (WLAs) for total nitrogen (TN), total phosphorus (TP) and total suspended solids (TSS) to meet applicable Virginia Water Quality Standards contained in 9VAC25-260-185.

Implementation of the Chesapeake Bay TMDL is currently accomplished in accordance with the Commonwealth of Virginia's Phase I Watershed Implementation Plan (WIP); approved by EPA on December 29, 2010. The approved WIP recognizes the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed of Virginia (9VAC25-820 et seq.) as controlling the nutrient allocations for non-significant Chesapeake Bay dischargers. The approved WIP states that for non-significant municipal facilities, nutrient WLAs are to be consistent with Code of Virginia procedures, which set baseline WLAs at 2005 permitted design capacity nutrient load levels.

The TN and TP wasteload allocations for non-significant facilities are considered aggregate allocations; however, in adherence with current agency guidance, this facility will be required to monitor TN effluent concentration levels during this permit term. Data collected from all non-significant facilities will be utilized to verify the estimated facility nutrient loads and the subsequent aggregate wasteload allocations found in the aforementioned WIP.

The WIP also considers TSS WLAs for non-significant facilities to be aggregate allocations; yet, TSS limits are to be included in individual VPDES permits in conformance with the technology-based requirements found in the Clean Water Act. Furthermore, the WIP recognizes that as long as the aggregated TSS permitted loads for all dischargers is less than the aggregated TSS load in the WIP, the individual permit will be consistent with the TMDL. This individual permit includes a monthly average TSS limit of 15 mg/L; therefore, this facility is in conformance with technology-based requirements and, in turn, consistent with the Chesapeake Bay TMDL.

Moreover, this individual permit includes limits for biochemical oxygen demand-5 day (BOD<sub>5</sub>) and D.O., which provide protection of instream D.O. concentrations of at least 5.0 mg/L. As such, the proposed effluent limits for these parameters are consistent with the Chesapeake Bay TMDL and will not cause an impairment or observed violation of the standards for D.O., chlorophyll a, or SAV as required by 9VAC25-260-185.

The full planning statement is found in **Attachment 7**.

c. Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, an unnamed tributary of Limestone Branch, is located within Section 8 of the Potomac River Basin and is a Class III water.

Class III waters must achieve a D.O. of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32° C, and maintain a pH of 6.0-9.0 standard units (S.U.) at all times.

Some water quality criteria are dependent on the temperature and pH or total hardness of the receiving stream and/or the final effluent. These values were utilized to determine the criteria found in **Attachment 8** (Freshwater Water Quality Criteria/Wasteload Allocation Analysis) for the following pollutants:

1) pH and Temperature for Ammonia Criteria

The fresh water, aquatic life Water Quality Criteria for ammonia is dependent on the instream pH and temperature. Additionally, since the effluent may also have an impact on the instream values, the pH and temperature values of the effluent must be considered when determining the ammonia criteria for the receiving stream. The 90th percentile pH and temperature values are utilized because they best represent the critical conditions of the receiving stream.

The critical 30Q10 and 1Q10 flows of the receiving stream have been determined to be 0.0 MGD. In cases such as this, effluent pH and temperature data alone may be utilized to establish the ammonia water quality criteria. See **Attachment 9** for the 90th percentile values of the effluent pH and temperature derived from all reported pH values for September 2010 through February 2016.

Staff finds no significant difference from the pH data used to establish ammonia criteria and subsequent effluent limits in the previous permit reissuance and this reissuance (a 90<sup>th</sup> percentile pH value of 8.7 S.U. was calculated for this reissuance and a 90<sup>th</sup> percentile pH value of 8.4 S.U. was used to establish ammonia criteria in the previous reissuance). Therefore, an effluent pH value of 8.4 S.U. shall be carried forward to determine ammonia criteria as part of this reissuance process.

Default temperature values of 25° C and 15° C for summer and winter were utilized to calculate ammonia criteria. The ammonia water quality standards calculations are shown in **Attachment 8**.

2) Hardness-Dependent Metals Criteria

The Water Quality Criteria for some metals are dependent on the receiving stream and/or effluent total hardness values (expressed as mg/L calcium carbonate).

There is no hardness data for this facility. Staff guidance suggests utilizing a default hardness value of 50 mg/L CaCO<sub>3</sub> for streams east of the Blue Ridge. The hardness-dependent metals criteria in **Attachment 8** are based on this default value.

3) Bacteria Criteria:

The Virginia Water Quality Standards at 9VAC25-260-170A state that the following criteria shall apply to protect primary recreational uses in surface waters:

*E. coli* bacteria per 100 ml of water shall not exceed a monthly geometric mean of the following:

	Geometric Mean <sup>1</sup>
Freshwater <i>E. coli</i> (N/100 ml)	126

<sup>1</sup>For a minimum of four weekly samples [taken during any calendar month].

d. Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370, and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, an unnamed tributary of Limestone Branch, is located within Section 8 of the Potomac River Basin. This section has been designated with a special standard of PWS.

Special Standard PWS designates a public water supply intake. The Board's Water Quality Standards establish numerical standards for specific parameters calculated to protect human health from toxic effects through drinking water and fish consumption. See 9VAC25-260-140 B for applicable criteria.

**16. Antidegradation (9VAC25-260-30):**

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2 water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

It is staff's professional judgment that the receiving stream be classified as Tier 1 based on the following: (1) the stream critical flows have been determined to be zero and (2) at times the stream may be comprised of only effluent. The proposed permit limits have been established by determining wasteload allocations that will result in attaining and/or maintaining all water quality criteria applicable to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

**17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:**

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points are equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards (WQS) are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. In this case since the critical flows 7Q10, 1Q10, and 30Q10 have been determined to be zero, the WLA's are equal to the WQS. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. In the case of ammonia evaluations, limits are needed if the 97<sup>th</sup> percentile of the thirty-day average effluent concentration values is greater than the chronic WLA. Effluent limitations are based on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

**a. Effluent Screening:**

Effluent data obtained from the discharge monitoring reports (DMRs) has been reviewed and determined to be suitable for evaluation. A summary of effluent data can be found in the permit file.

The following pollutants require a wasteload allocation analysis: ammonia as this facility is treating domestic sewage and chlorine since it is the method for disinfection.

**b. Mixing Zones and Wasteload Allocations (WLAs):**

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{Co [ Qe + ( f ) ( Qs ) ] - [ ( Cs ) ( f ) ( Qs ) ]}{Qe}$$

Where:	WLA	= Wasteload allocation
	Co	= In-stream water quality criteria
	Qe	= Design flow
	Qs	= Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
	f	= Decimal fraction of critical flow
	Cs	= Mean background concentration of parameter in the receiving stream.

The water segment receiving the discharge via Outfall 001 is considered to have a 7Q10, 1Q10, and 30Q10 of 0.0 MGD. As such, there is no mixing zone and the WLA is equal to the Co.

c. Effluent Limitations Toxic Pollutants, Outfall 001

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The VPDES Permit Regulation at 9VAC25-31-230.D requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N

Staff calculated the water quality criteria used to determine ammonia limits based on a pH value of 8.4 S.U., a summer temperature of 25°C, and a winter temperature of 15°C (see Section 15.c 1) of this fact sheet). A sole data point of 9.0 mg/L as recommended by DEQ guidance for discharges containing domestic sewage was used to ensure the evaluation adequately addressed the potential presence of ammonia.

This analysis resulted in a monthly and weekly average limitation of 1.3 mg/L, as was the case in the previous permit reissuance. See **Attachment 10** for the calculation of the current ammonia limitations and the calculation of the ammonia limitations for the 2011 permit reissuance.

The Environmental Protection Agency (EPA) finalized new, more stringent ammonia criteria in August 2013; possibly resulting in significant reductions in ammonia effluent limitations. It is staff's best professional judgment that incorporation of these criteria into the Virginia Water Quality Standards is forthcoming. This facility and others may be required to comply with new criteria in this permit term or during their next permit term.

2) Total Residual Chlorine

Chlorine is utilized for disinfection and is potentially in the discharge. Staff calculated WLAs for TRC using current critical flows and the mixing allowance, as applicable. In accordance with current DEQ guidance, staff employed a default data point of 0.2 mg/L and the calculated WLAs to derive limits. A monthly average of 0.008 mg/L and a weekly average limit of 0.010 mg/L are proposed for this discharge (see **Attachment 10**).

3) Metals/Organics

It is staff's professional judgment that given the wastewater sources; limitations are not warranted at this time.

d. Effluent Limitations and Monitoring, Outfall 001 – Conventional and Non-Conventional Pollutants

No changes to D.O., BOD<sub>5</sub>, TSS, and pH limitations are proposed.

The BOD<sub>5</sub> and D.O. limits are based on the water quality standards and the stream model dated January 27, 2010 (see **Attachment 11**).

It is staff's practice to equate the TSS limits with the BOD<sub>5</sub> limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

*E. coli* limitations are in accordance with the Water Quality Standards 9VAC25-260-170.

e. Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients

As discussed in Section 15.b of this Fact Sheet, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Nonsignificant discharges located within the Chesapeake Bay Watershed are subject to aggregate wasteload allocations for TN, TP, and sediments under the Chesapeake Bay TMDL. Monitoring for nitrates + nitrites, TKN, and TP are included in this permit during this permit term to assess and verify the aggregate wasteload allocations.

f. Effluent Limitations and Monitoring Summary

Effluent limitations and monitoring requirements are presented in Section 19 of this fact sheet. Limits were established for pH, BOD<sub>5</sub>, TSS, ammonia as N, D.O., TRC, and *E. coli*. Effluent monitoring and reporting for flow, TKN, nitrate+nitrite, total nitrogen, and total phosphorus are also included with this reissuance.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/L), with the flow values (in MGD) and a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD and TSS (or 65% for equivalent to secondary). The limits in this permit are water-quality-based effluent limits and result in greater than 85% removal.

**18. Antibacksliding:**

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.



**19. Effluent Limitations/Monitoring Requirements:**

Design flow is 0.016 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS						MONITORING REQUIREMENTS	
		Monthly Average		Weekly Average		Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL		NA		NA	NL	Continuous	TIRE
pH	1	NA		NA		6.0 S.U.	9.0 S.U.	1/D	Grab
Biochemical Oxygen Demand <sup>a</sup> (BOD <sub>5</sub> )	1, 2	15 mg/L	0.91 kg/day	22 mg/L	1.3 kg/day	NA	NA	1/M	Grab
Total Suspended Solids (TSS) <sup>a, b</sup>	3	15 mg/L	0.91 kg/day	22 mg/L	1.3 kg/day	NA	NA	1/M	Grab
Dissolved Oxygen (D.O.)	1, 2	NA		NA		6.5 mg/L	NA	1/D	Grab
Ammonia, as N	1	1.3 mg/L		1.3 mg/L		NA	NA	1/M	Grab
<i>E. coli</i> (Geometric Mean) <sup>c</sup>	3, 4	126 n/100mL		NA		NA	NA	1/W	Grab
Total Residual Chlorine (after contact tank)	5	NA		NA		1.5 mg/L	NA	1/D	Grab
Total Residual Chlorine (after dechlorination)	1	0.008 mg/L		0.010 mg/L		NA	NA	1/D	Grab
Total Kjeldahl Nitrogen (TKN)	6, 7	NA		NA		NA	NL mg/L	1/YR <sup>f</sup>	Grab
Nitrate+Nitrite, as N	6, 7	NA		NA		NA	NL mg/L	1/YR <sup>f</sup>	Grab
Total Nitrogen <sup>d, e</sup>	6, 7	NA		NA		NA	NL mg/L	1/YR <sup>f</sup>	Calculated
Total Phosphorus <sup>e</sup>	6, 7	NA		NA		NA	NL mg/L	1/YR <sup>f</sup>	Grab

The basis for the limitations codes are:

	MGD	=	Million gallons per day.		1/D	=	Once every day.
1. Water Quality Standards	NA	=	Not applicable		1/M	=	Once every month.
2. Stream Model -- <b>Attachment 11</b>	NL	=	No limit: monitor and report.		1/W	=	Once every week.
3. Professional Judgment	TIRE	=	Totalizing, indicating and recording equipment.		1/YR	=	Once every year.
4. Limestone Branch Bacteria TMDL	S.U.	=	Standard Units.				
5. DEQ Disinfection Guidance							
6. Chesapeake Bay TMDL/WIP							
7. Guidance Memo No. 14-2011 – <i>Nutrient Monitoring for “Nonsignificant” Discharges to the Chesapeake Bay Watershed</i>							

Grab= An individual sample collected over a period of time not to exceed 15 minutes.

- At least 85% removal for BOD<sub>5</sub> and TSS (or 65% for equivalent to secondary) shall be attained for this effluent.
- TSS shall be expressed as two significant figures.
- Samples shall be collected between 10:00 a.m. and 4:00 p.m., seven (7) days apart.
- Total Nitrogen = Sum of TKN plus Nitrate+Nitrite
- See Section 20. for more information on the Nutrient Calculations.
- The annual monitoring period shall be January 1 – December 31. The monitoring data shall be submitted no later than the 10<sup>th</sup> day of the month following the monitoring period (January 10).

**20. Other Permit Requirements:**

Part I.B. of the permit contains additional chlorine monitoring requirements, quantification levels and compliance reporting instructions

These additional chlorine requirements are necessary per the Sewage Collection and Treatment Regulations at 9VAC25-790 and by the Water Quality Standards at 9VAC25-260-170. Minimum chlorine residual must be maintained at the exit of the chlorine contact tank to assure adequate disinfection. No more than 10% of the monthly test results for TRC at the exit of the chlorine contact tank shall be  $< 1.0$  mg/L with any TRC  $< 0.6$  mg/L considered a system failure. *E. coli* limits are defined in this section as well as monitoring requirements to take effect should an alternate means of disinfection be used.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an instream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

**21. Other Special Conditions:**

- a. 95% Capacity Reopener The VPDES Permit Regulation at 9VAC25-31-200.B.4 requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. The facility is a PVOTW.
- b. Indirect Dischargers Required by VPDES Permit Regulation, 9VAC25-31-200 B.1 and B 2 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.
- c. O&M Manual Requirement Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. The permittee shall maintain a current Operations and Maintenance (O&M) Manual. The permittee shall operate the treatment works in accordance with the O&M Manual and shall make the O&M Manual available to Department personnel for review upon request. Any changes in the practices and procedures followed by the permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.
- d. CTC, CTO Requirement The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.
- e. Licensed Operator Requirement The Code of Virginia at §54.1-2300 et seq., the VPDES Permit Regulation at 9VAC25-31-200 C, and the Board for Waterworks and Wastewater Works Operators and Onsite Sewage System Professionals Regulations at 18VAC160-20-10 et seq. requires licensure of operators. This facility requires a Class IV Operator.
- f. Reliability Class The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet Reliability Class I.
- g. Water Quality Criteria Reopener The VPDES Permit Regulation at 9VAC25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.
- h. Sludge Reopener The VPDES Permit Regulation at 9VAC25-31-220.C requires all permits issued to treatment works treating domestic sewage (including sludge-only facilities) include a reopener clause allowing incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the CWA.

- i. Sludge Use and Disposal The VPDES Permit Regulation at 9VAC25-31-100.P; 220.B.2, and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on their sludge use and disposal practices and to meet specified standards for sludge use and disposal. The facility includes a treatment works treating domestic sewage.
- j. Nutrient Reopener 9VAC25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.
- l. Treatment Works Closure Plan The State Water Control Law §62.1-44.15:1.1, makes it illegal for an owner to cease operation and fail to implement a closure plan when failure to implement the plan would result in harm to human health or the environment. This condition is used to notify the owner of the need for a closure plan where a facility is being replaced or is expected to close.
- m. TMDL Reopener This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.
- n. Pharmaceutical Management and Disposal This sewage treatment works serves a psychiatric hospital. Due to this designation (SIC Code 8063), a large volume of pharmaceuticals are used at the facility. This permit shall require the development of a Pharmaceutical Management and Disposal Plan that shall address the proper handling, storage, and disposal of pharmaceuticals to prevent the discharge of unused medications into the wastewater treatment system. A plan shall be developed that is consistent with all applicable regulatory requirements, including those for the proper handling and disposal of solid, biological, and/or hazardous wastes. The plan shall be submitted to DEQ for review and approval within 180 days of this permit reissuance date and shall be enforceable under the permit.

## 22. Permit Section Part II.

Required by VPDES Regulation 9VAC25-31-190, Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

## 23. Changes to the Permit from the Previously Issued Permit:

- a. Special Conditions:
  - a. A Pharmaceutical Management and Disposal Special Condition has been added.
  - b. A Water Quality Criteria Special Condition has been added.
  - c. A Nutrient Reopener Special Condition has been added.
- b. Monitoring and Effluent Limitations:

An annual monitoring requirement for TKN, NO<sub>3</sub>-NO<sub>2</sub>, and TP has been added.
- c. Other:

The Outfall 001 Latitude/Longitude has been revised.

## 24. Variances/Alternate Limits or Conditions:

None

## 25. Public Notice Information:

First Public Notice Date: 6/29/2016

Second Public Notice Date: 7/6/2016

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3837, [anna.westernik@deq.virginia.gov](mailto:anna.westernik@deq.virginia.gov). See **Attachment 12** for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

**26. Additional Comments:**

a. Previous Board Action:

Loudoun Water, the previous operator of this sewage treatment works, was referred to enforcement in January 2010 for failing to submit an adequate plan for ensuring continued compliance with the terms of the permit when the facility reached 95% of its design capacity. On January 15, 2010, Loudoun Water submitted a permit application requesting a modification of the permit to re-rate the plant to a higher flow tier. On August 4, 2011, a CTO for the 0.016 MGD flow tier was issued, and DEQ reissued the VPDES permit with the 0.016 MGD flow tier. As it was determined that the facility was no longer at 95% of its design capacity, this case was dereferred effective August 22, 2011. See **Attachment 1** for the CTO and **Attachment 13** for the Enforcement Case Closure Memorandum dated August 17, 2011.

b. Staff Comments:

None

c. Public Comment:

No comments were received during the public notice.

## ATTACHMENTS

Attachment 1	August 4, 2011 CTO for the 0.016 MGD Flow Tier
Attachment 2	The Waterworks Operations Permit Dated October 2, 2015
Attachment 3	Flow Value Summary for the September 2011 through March 2016 Period
Attachment 4	Facility Schematic/Diagram
Attachment 5	Waterford Quadrangle (DEQ Map 215A)
Attachment 6	DEQ Technical Inspection Dated August 27, 2013
Attachment 7	Planning Statement Dated April 7, 2016
Attachment 8	Summary of Water Quality Criteria and Wasteload Allocations
Attachment 9	90th percentile values of the effluent pH and temperature derived from maximum pH values for September 2010 through February 2016
Attachment 10	Toxic Pollutants Limits Determination
Attachment 11	Stream Model Dated January 27, 2010
Attachment 12	Public Notice
Attachment 13	Enforcement Case Closure Memorandum dated August 17, 2011



# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF ENVIRONMENTAL QUALITY

### NORTHERN REGIONAL OFFICE

13901 Crown Court, Woodbridge, Virginia 22193  
(703) 583-3800 Fax (703) 583-3821  
[www.deq.virginia.gov](http://www.deq.virginia.gov)

Douglas W. Domenech  
Secretary of Natural Resources

David K. Paylor  
Director

Thomas A. Faha  
Regional Director

August 4, 2011

Loudoun County  
North Spring Behavioral Healthcare – Evaluation of the Re-Rating of the WWTP  
PTL#24795, Permit VA0067938

Mr. David Winters  
North Spring Behavioral Healthcare  
42009 Victory Ln  
Leesburg, VA 20178

Dear Mr. Winters:

In accordance with 9VAC25-790-190 of the Commonwealth of Virginia's *Sewage Collection and Treatment Regulations*, this letter transmits the Certificate to Operate (CTO) for North Spring Behavioral Healthcare – Evaluation of the Re-Rating of the WWTP located in Loudoun County. The CTO is being issued based on the Application for Certificate to Operate dated February 25, 2010, and received by this office on March 1, 2010. This CTO is being issued concurrently with the VPDES permit reissuance which authorizes this increased flow tier.

If you have any questions about this letter or the approval process, please contact me at (703)-583-3834 or [alison.thompson@deq.virginia.gov](mailto:alison.thompson@deq.virginia.gov).

Respectfully,

A handwritten signature in black ink, appearing to read "Alison Thompson".

Alison Thompson  
Water Permits Technical Reviewer

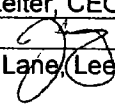
cc: VPDES Permit File VA0067938  
VDH District Office, attn: Environmental Health Manager  
Loudoun County Local Building Official  
R. Bruce Ringrose, Loudoun Water, PO Box 4000, Ashburn, VA 20146

Attachment: CTO

Attachment 1

**Department of Environmental Quality**  
**APPLICATION for CERTIFICATE TO OPERATE**  
**Under the Sewage Collection and Treatment Regulations 9 VAC 25-790**  
**and/or the Water Reclamation and Reuse Regulation 9 VAC 25-740**

See instructions. Submit 1 copy of this form and any attachments. Form will expand as you enter information. MAR 01 2010

Project Title: (as it appears on plans) North Spring Behavioral Healthcare - Evaluation of the Re-Rating of the WWTP	
P.E. Seal Date on Cover: February 22, 2010	
Specifications Title and Date: N/A	
Location of Project: US Rte 15 - 1.0 miles N of Leesburg, VA	County/City: Loudoun County
Receiving Wastewater Collection System(s): UN Trib - Limestone Branch	
Receiving Sewage Treatment Plant(s): North Spring Behavioral Healthcare - Wastewater Treatment Plant (WWTP)	
<b>PROJECT OWNER: North Spring Behavioral Healthcare</b>	<b>RESPONSIBLE ENGINEER</b>
Name & Title: L. Scott Zeiter, CEO	Name: R. Bruce Ringrose, PE
Signature and Date:  2-25-10	Company Name: LCSA dba Loudoun Water
Address: 42009 Victory Lane, Leesburg, VA 20178	Address: 44865 Loudoun Water Way, Ashburn, VA 20146
Phone: 703-777-0832	Phone: 571-291-7910
Email: scott.zeiter@psysolutions.com	Email: bringrose@loudounwater.org

**PTL NUMBER FROM CERTIFICATE TO CONSTRUCT: N/A**

**Attach** Copy of the original Certificate to Construct if issued prior to November 9, 2008. If applicable, provide verification of compliance with any conditions in the Certificate to Construct.

Design Flow: (a) average daily flow (MGD): 0.016 (b) peak flow (MGD): 0.040

For sewage treatment plant, water reclamation or satellite reclamation projects, provide the VPDES/VPA Permit Number: VA0067938

Is a new Discharge Monitoring Report (DMR) or other monthly monitoring report required? Yes ☐ No ☒

For Pump Stations, Sewage Treatment Plants, and Reclamation Systems, check Reliability Class: I ☒ II ☐ III ☐  
NA ☐

Two options are provided for the Statement of Completion, depending on whether the project is being authorized under the Sewage Collection and Treatment Regulations, the Water Reclamation and Reuse Regulations, or BOTH. Please check the appropriate box and then provide signature and seal below as indicated.

☒ *The following statement of completion for issuance of a Certificate to Operate under the Sewage Collection and Treatment Regulations must be signed and sealed by the responsible engineer. (DEQ will not conduct a confirming inspection.)*

***"The construction of the project has been completed in accordance with the referenced plans and specifications or revised only in accordance with 9 VAC 25-790-180.B, and inspections have been performed to make this statement in accordance with Section 9 VAC 25-790-180.C.1 of the Sewage Collection and Treatment Regulations."***



Licensed Engineer's Signature and original seal (signed and dated)

- ☐ The following statement of completion for issuance of a Certificate to Operate under the Water Reclamation and Reuse Regulation must be signed and sealed by the responsible engineer. (DEQ will not conduct a confirming inspection.)

**"The construction of the project has been completed in accordance with the referenced plans and specifications or revised only in accordance with 9 VAC 25-740-120-B.2.b. and inspections have been performed to make this statement in accordance with Section 9 VAC 25-40-120.B.3.a. of the Water Reclamation and Reuse Regulations."**

\_\_\_\_\_  
Licensed Engineer's Signature and original seal (signed and dated)

.....  
For DEQ use only:

In accordance with *Code of Virginia* 1950, as amended, Title 62.1, Section 62.1-44.19, this form, signed by the appropriate DEQ representative, serves as the **Certificate to Operate** for the referenced project.

Alison Thompson  
Name

  
Signature

8/4/11  
Date

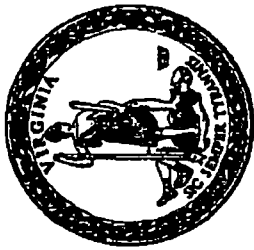
24795  
CTO PTL Number

Department of Environmental Quality Authorized Representative

An Operation and Maintenance Manual must be submitted to the DEQ Regional Office in accordance with 9 VAC 25-790 for sewage treatment plants, 9 VAC 25-740 for water reclamation systems and satellite reclamation systems and VPDES or VPA permit requirements.

For pump stations, an Operation and Maintenance Manual must be maintained for the facility in accordance with 9 VAC 25-790, but is NOT to be submitted to DEQ. The pump station must be operated and maintained in accordance with that manual.





Virginia Department of Health  
Office of Drinking Water

## Waterworks Operation Permit

North Spring Behavioral Healthcare, Inc. is hereby granted permission to operate the North Spring Behavioral Healthcare waterworks, Class 4 community waterworks located in Loudoun County, in accordance with Title 32.1 of the *Code of Virginia* and 12VAC5-590 *et seq.* of the *Virginia Waterworks Regulations*. The waterworks has a capacity of 31,200 gpd. This permit is issued with the understanding that this owner shall operate the waterworks in accordance with Part II of the *Virginia Waterworks Regulations* titled "Operation Regulations for Waterworks". This permit does not suspend, minimize, or otherwise alter this owner's obligation to comply with applicable federal, state, or local laws and regulations or permits. This permit may be revoked at any time upon written notice of revocation by the State Health Commissioner; if it is determined that North Spring Behavioral Healthcare, Inc. has failed to comply with this permit, including the Operation Permit Conditions.

Variances or Exemptions issued: (X) None ( ) See Attached

Operation Permit Conditions attached

PERMIT NO.: 6107725

EFFECTIVE DATE: October 2, 2015

APPROVED

  
John J. Aasbach II, PE, Director, Office of Drinking Water  
for the State Health Commissioner pursuant to VA Code § 2.2-604

## OPERATION PERMIT CONDITIONS

Operation Permit No.: 6107725

Waterworks Name: North Spring Behavioral Healthcare

Permit Effective Date: October 2, 2015

Waterworks Class: 4

### OPERATOR REQUIREMENTS:

A Class 4 operator shall be in attendance at the waterworks each day the plant is in operation for sufficient time to perform necessary monitoring and process evaluation, and to make any process adjustments.

### TREATMENT TECHNIQUE REQUIREMENTS:

This waterworks shall meet the following treatment techniques:

#### Surface Water Treatment Rule and LT1 Enhanced Surface Water Treatment Rule

Required microbial filtration removal and/or disinfection inactivation:

Virus: 4 log

Giardia: 3 log

Cryptosporidium: 2 log

Required Turbidity removal:

The combined filter effluent turbidity shall be less than or equal to 0.3 NTU in 95% of measurements recorded each month. The combined filter effluent turbidity shall not exceed 1 NTU.

### OPERATION, MONITORING, AND REPORTING:

Operation, monitoring, and reporting shall be in accordance with Title 32.1 of the *Code of Virginia* and 12VAC5-590 *et seq.* of the *Virginia Waterworks Regulations*. The State Board of Health of the Commonwealth of Virginia has issued additional operational, monitoring, and reporting requirements. This waterworks is subject to the following additional requirements:

#### 1. Specific operational requirements for membrane filtration:

1. In order to achieve a 3 log removal credit of Giardia and 3 log removal credit of Cryptosporidium, the water treatment plant shall consistently maintain (as reported on the monthly operation report):
  - a. The combined filter effluent turbidity at less than or equal to 0.3 NTU in 95% of measurements recorded each month.
  - b. The combined filter effluent turbidity at less than or equal to 1 NTU in all measurements recorded each month.
2. An additional 0.5 log inactivation of Giardia by free chlorine shall be maintained.
3. 4 log inactivation of virus by free chlorine disinfection as reported on the monthly operation report shall be maintained.

OPERATIONAL CONTROL PARAMETER	ALARM SET POINT	SHUTDOWN SET POINT
Entry Point Free Chlorine Residual	Not less than 1.5mg/L	Not less than 1.1 mg/L
Direct Integrity Test; Log Removal Value (LRV)	0.3 psi over 5 minutes; Equivalent to LRV not less than 3.5	0.7 psi over 5 minutes; Equivalent to LRV not less than 3.0
Membrane Filtrate Turbidity	Not greater than 0.10 NTU	Not greater than 0.3 NTU

### **WATERWORKS CAPACITY:**

#### **Source Capacity:**

Well #1: 31,200 gpd

#### **Treatment Capacity:**

The following treatment is provided:

- Membrane Filtration, Microfiltration (log inactivation treatment technique requirement)
- Chlorine Disinfection – hypochlorite (log inactivation treatment technique requirement)

Limiting treatment capacity: 70,200 gpd based on the membrane filtration treatment process

#### **Storage and Delivery Requirements:**

The waterworks shall provide sufficient storage and distribution pumping capacity to provide a minimum working pressure of 20 psig at all service connections.

The total available system effective storage volume is 16,244 gal which is equivalent to ½ day storage of the water demand of 32,488 gpd.

#### **Permitted Capacity:**

This waterworks is permitted for a capacity of 31,200 gpd due to limited source capacity.

**VIRGINIA DEPARTMENT OF HEALTH  
WATERWORKS DESCRIPTION SHEET**

**DATE:** October 2, 2015

<b>WATERWORKS NAME:</b>	North Spring Behavioral Healthcare	<b>WATERWORKS CLASS:</b> 4
<b>COUNTY/CITY:</b>	Loudoun County	<b>TYPE:</b> Community
<b>LOCATION:</b>	Proceed north on Route 15 from the Town of Leesburg, take a left onto Victory Lane, just after the end of the Leesburg Bypass	
<b>OWNER:</b>	North Spring Behavioral Healthcare, Inc. <b>Contact:</b> David Winters 42009 Victory Lane Leesburg, VA 20176 <b>Phone:</b> 703-777-0800	
<b>OPERATOR:</b>	Licensed Class 4 Operator Required	
<b>PERMIT NUMBER:</b>	6107725	
<b>TYPE OF TREATMENT:</b>	Membrane filtration, sodium hypochlorite disinfection (0.5 log Giardia)	
<b>SOURCE:</b>	One groundwater well determined to be GUDI	
<b>CAPACITY:</b>	31,200 gpd	

**DESCRIPTION OF THE WATERWORKS**

This system consists of a well determined to be GUDI, membrane treatment unit, sodium hypochlorite disinfection (0.5 log Giardia inactivation), 5,000 gallon and 12,000 gallon atmospheric storage tanks, 2,000 gallon hydropneumatic tank, and booster pumps that provide potable water to a distribution system serving the Children's Center building, Manor House, Big School Academy building and wastewater treatment plant. The Manor House is provided with a booster pump, a meter and three small pressure tanks.

**Well**

The well was completed on January 31, 1977, with a hole size of 10 inches from 0 to 62 ft and 6 inches from 62 to 140 ft. The well has a 6-inch casing to 62 ft and is grouted to 62 ft. The well yielded 39 gpm during a 48 hour test period. The well is situated in a concrete culvert type enclosure with an overlapping concrete lid and a concrete floor with a screened drain to atmosphere. On November 19, 2012, the well was determined to be Groundwater under the Direct Influence of Surface Water (GUDI) and filtration and 0.5 log Giardia inactivation disinfection treatment is required.

Well appurtenances include a raw water sampling tap, sanitary seal, and 2-inch discharge line with a check valve, pressure relief valve and gate valve. The well is equipped with a submersible pump capable of delivering 40 gpm at 270 ft TDH. The observed pumping rate is 52 gpm to the membrane plant feed tank.

### **Filter Building**

The building is of wood frame construction, approximately 20 ft by 20 ft in size and located at the rear of the hospital facility, behind the parking lot and adjacent to the booster pump building. The hypochlorite feed facility, laboratory equipment and filtration unit are located in the building. The building has heating, lighting, forced ventilation, a concrete floor and floor drains.

### **Membrane Filtration**

One microfiltration membrane unit is installed in the filter building along with the related appurtenances. Flow from the well is piped to the membrane unit. The membrane unit is a Pall Aria, model AX-2, provided with five hollow fiber, pressure-driven microfiltration membrane modules, utilizing 0.1  $\mu$  polyvinylidene fluoride (PVDF) membrane material and operating in an outside-in filtration mode. Each membrane module is rated for a nominal flow rate of 18.7 gpm based upon a membrane flux rate of 50 GSFD and module area of 538 ft<sup>2</sup>, and the membrane unit is rated by the manufacturer at up to 94 gpm.

Two 119-gallon pre-pressurized bladder tanks are provided to supply pressurized water for the flux maintenance cycle. One installed and one shelf spare air compressor and receiver tank are provided to supply compressed air to operate control valves and for the direct integrity test.

The submersible well pump delivers water to a 50 gallon feed tank. A 3 HP centrifugal feed pump delivers raw water from the feed tank, through the membrane, to the booster pump building. The filtered water flowrate is measured by a flow meter and the speed of the feed pump is controlled by the PLC and a variable frequency drive. The feed pump rate is set to pace the well pumping rate to minimize the number of pump starts and stops. Therefore, the maximum filtration capacity is 52 gpm.

Membrane integrity is verified by a daily pressure decay test initiated manually by the system operator. The pressure decay test consists of displacing the water on the feed side of the membrane with compressed air at approximately 27 psi and monitoring the pressure decay over a period of at least 5 minutes. If the pressure decay is less than 0.3 psi over 5 minutes, the Log Removal Value (LRV) is at least 3.5 and the membrane integrity is confirmed. The log removal value (LRV) is calculated from the test and reported in the monthly operation report.

An automatic flux maintenance cycle controls the buildup of material that can increase the transmembrane pressure across the membranes. A flux maintenance event is triggered based on the measured volume of filtrate produced or time in service and generally will be triggered after approximately 20 minutes of operation. The flux maintenance event begins with charging the two 119-gallon bladder tanks with filtered water. The next step is air scrub with reverse flow consisting of introducing compressed air into the feed port at 3 cfm/membrane module and reverse flow through the membrane at 6-8 gpm per module to the system drain. The next step is a feed flush, consisting of feed water through the membrane to the system drain at 70 gpm. After feed flush, the flow is returned to normal forward flow by closing the drain valve and opening the filtrate valve, and adjusting the feed pump speed to meet the filtrate flow rate setpoint.

A self-cleaning 200 micron feed strainer is provided to protect the membrane modules from damage or clogging from large particles and debris. The strainer is cleaned on a predetermined frequency set in the PLC or upon reaching a preset differential pressure across the strainer. During a feed strainer backwash, the valve on the outlet of the strainer is closed and the strainer backwash drain valve is opened to allow flow to the system drain.

Chemical cleaning of the membrane modules is completed periodically to return the membranes to their original transmembrane pressure. Chemicals used in the solution include sodium hypochlorite, sodium hydroxide, and citric acid. The circulation of the cleaning systems is automated, but the blending of the

solutions is completed manually. Used chemical cleaning solution are discharged to a neutralization tank and bled into the onsite wastewater treatment plant.

#### **Disinfection Treatment**

Water from the filter unit is treated with sodium hypochlorite and flows to the existing booster pump building through a flow meter and to a contact chamber consisting of 430 ft of 8-inch PVC SDR-21 water line to provide contact time necessary to achieve 0.5 log Giardia inactivation and 4.0 log virus inactivation. The contact chamber is underground, beginning at the booster pump building. Installed equipment includes a metering pump rated at 35 gpd and a 50 gallon solution tank. A minimum of 1.1 mg/L free chlorine is required to provide 0.5 log Giardia inactivation at 52 gpm and 10 C.

#### **Instrumentation and Controls**

Operational monitoring of the water treatment facility includes the membrane unit control panel that monitors filtration rate and the flux maintenance cycle. A laser nephelometer is provided to monitor filtrate water turbidity and a continuous chlorine residual monitor is provided to monitor disinfectant residual. An alarm and unit shutdown system is provided that monitors filtrate turbidity, low chlorine residuals, and a general fault from the Pall filtration unit skid. Upon an alarm, facility and waterworks operations personnel are notified by telephone. Lab equipment is provided for pH, temperature, chlorine residual and turbidity measurements.

#### **Booster Pump Building**

The building is pre-cast concrete, approximately 10 ft by 12 ft in size and located at the rear of the hospital facility, behind the parking lot. The continuous chlorine residual meter, booster pumps, control panel, and one end of the hydropneumatic tank are located in the building. The building has heating, lighting, forced ventilation, a concrete floor and floor drain.

#### **Bulk Storage Tanks**

The 5,000 gallon carbon steel horizontal atmospheric storage tank is located adjacent to the booster pump building, with dimensions of 8 ft in diameter and 13 ft 7 inches (straight side) long. The effective volume with the high water elevation of 7 feet 4 inches above the bottom is approximately 4,600 gallons. The tank is equipped with a screened overflow pipe, drain pipe, screened roof vent, roof access hatch, level switches, level transmitter, separate inlet and outlet pipes, and other accessories.

The 12,000 gallon horizontal welded steel ground storage tank is 8 ft in diameter and 32 ft long. This tank is located adjacent to and plumbed in series with the 5,000 gallon horizontal cylindrical atmospheric storage tank and has the same bottom and top elevations. The effective storage volume is 10,891 gallons, deducting for the volume below the lowest liquid level (booster pump low level cutoff) and the volume above the highest liquid level (well pump off). The tank is equipped with a 4-inch inlet pipe and a 4-inch outlet pipe. A bypass valve and shutoff valves are provided to facilitate taking the tank offline. The tank is equipped with a 4-inch screened overflow pipe, 4-inch drain pipe, 4-inch vent pipe with a screen, and a 24-inch square access hatch.

#### **Booster Pumps**

Two booster pumps deliver the water from the bulk storage tanks to the hydropneumatic tank. A check valve, and ball valve are on the discharge side of each pump. The pumps are equipped with a common discharge pressure gauge. A compound pressure gauge and a ball valve are on the suction side of each pump. Each pump is equipped with a 7.5-hp motor, and is capable of pumping 78 gpm at 200 ft of TDH.

#### **Hydropneumatic Tank**

The 2,000-gallon steel pressure tank, ASME stamped tank, is 5 ft in diameter and 16 ft long. The tank is equipped with appurtenances including a man way, sight glass, pressure relief valve, air release valve,

pressure gauge, pressure switches, level switch, sample tap, drain, air compressor, isolation valves, bypass piping, etc. The appurtenance end of the tank is located in the booster pump building.

### **Distribution System**

The distribution system serves four buildings at the facility – Children's Center building (which is a residential psychiatric facility), Manor House (which is office space), Big School Academy building, and wastewater treatment plant. At the Manor House, there are three small 62-gallon bladder tanks filled by a 1.5 hp booster pump, forming a special pressure zone. The bladder tanks have a common drain and a meter is provided on the booster pump discharge pipe prior to the pressure tanks.

### **Control Summary**

The treatment/pumping facility control panel controls the operation of the treatment/pumping facility and associated well.

The membrane feed pump is started when the level in the bulk storage tank drops to 24 inches below the top and the pump shuts off upon reaching 8 inches below the top. The water level in the storage tank is displayed on the control panel. The well pump is started when the level in the filtration feed tank drops to a predetermined level. A HOA switch is also provided to allow hand operation of the well pump.

The lead booster pump starts when the system pressure drops to 70 psig and shuts off when the pressure reaches 90 psig. The lag booster pump starts when the system pressure drops to 60 psig and shuts off when the pressure reaches 70 psig. The pumps are in an alternating lead/lag arrangement. The controls shut off the pumps if a minimum storage tank level is detected.

The sodium hypochlorite chemical feed pump is activated by a flow switch installed in the pipe from the filtration unit. The hydropneumatic tank air compressor is controlled by a level switch installed on the hydropneumatic tank face piping. A high pressure cut-off switch locks the air compressor off in the event of a high pressure.

## **CAPACITY EVALUATION OF THE WATERWORKS**

### **1. Estimated Water Demand:**

Average Daily Demand = 15,200 gpd\*

\*(Based on Monthly Operation Reports, August 2014 –July 2015)

### **2. Source Capacity:**

Well #	Well Yield		Well Pump		Limiting Capacity
	gpm	gpd <sup>1</sup>	gpm	gpd <sup>2</sup>	gpd
1	39	31,200	52	74,880	31,200

<sup>1</sup> gpd = gpm (1,440 min/day) / 1.8 SF

<sup>2</sup> gpd = gpm (1,440 min/day)

### **3. Treatment Capacity:**

Membrane Filtration Treatment Unit Capacity:

One unit with five membrane modules, total max feed rate = 52 gpm  
(52 gpm) (22.5 hours/day\*) (60 minutes/hour) = 70,200 gpd

\*Maximum of 22.5 hours operation per day with 1.5 hours per day for integrity testing and cleaning operations.

Chemical feeders are not limiting.

4. Booster Pump Capacity: 78 gpm with one pump in operation  
(78 gpm)(1440 min/day) = 112,320 gpd
5. Storage Capacity: 10,891 gal + 4,600 gal + (2000 gal/3) + [(3)(86 gal/3)] = 16,244 gal  
16,244 gallons / 0.5 day = 32,488 gpd

**Conclusion:**

This waterworks is permitted for a capacity of 31,200 gpd due to limited well yield.

**OPERATION PERMIT HISTORY**

Permit Issuance (Effective Date)	Description / Reason
November 4, 1977	Original Issuance
May 3, 1978	Amended name of owner
November 3, 1978	Amended design capacity to 30 patients and 21 staff
May 23, 1994	Revised design capacity based on adding 2,000 gal atmospheric tank
July 14, 1998	Facility sold and permit issued to Piedmont Behavioral Management Associates
September 10, 2004	Facility sold and permit issued to Psychiatric Solutions of Virginia, amended design capacity to 77 beds, changed to a community waterworks
November 25, 2008	Replaced storage, amended design capacity to 12,000 gpd per construction permit 6023006 issued March 31, 2006.
January 21, 2014	Change in ownership to UHS of Delaware, Inc. Added membrane filtration treatment and 0.5 log Giardia inactivation treatment per construction permit 601813 dated May 31, 2013, reduced design capacity due to decommissioning one storage tank.
February 13, 2014	Amended name of owner to North Spring Behavioral Healthcare, Inc.
October 2, 2015	Added atmospheric storage tank, amended design capacity per construction permit 602415 dated May 29, 2015.



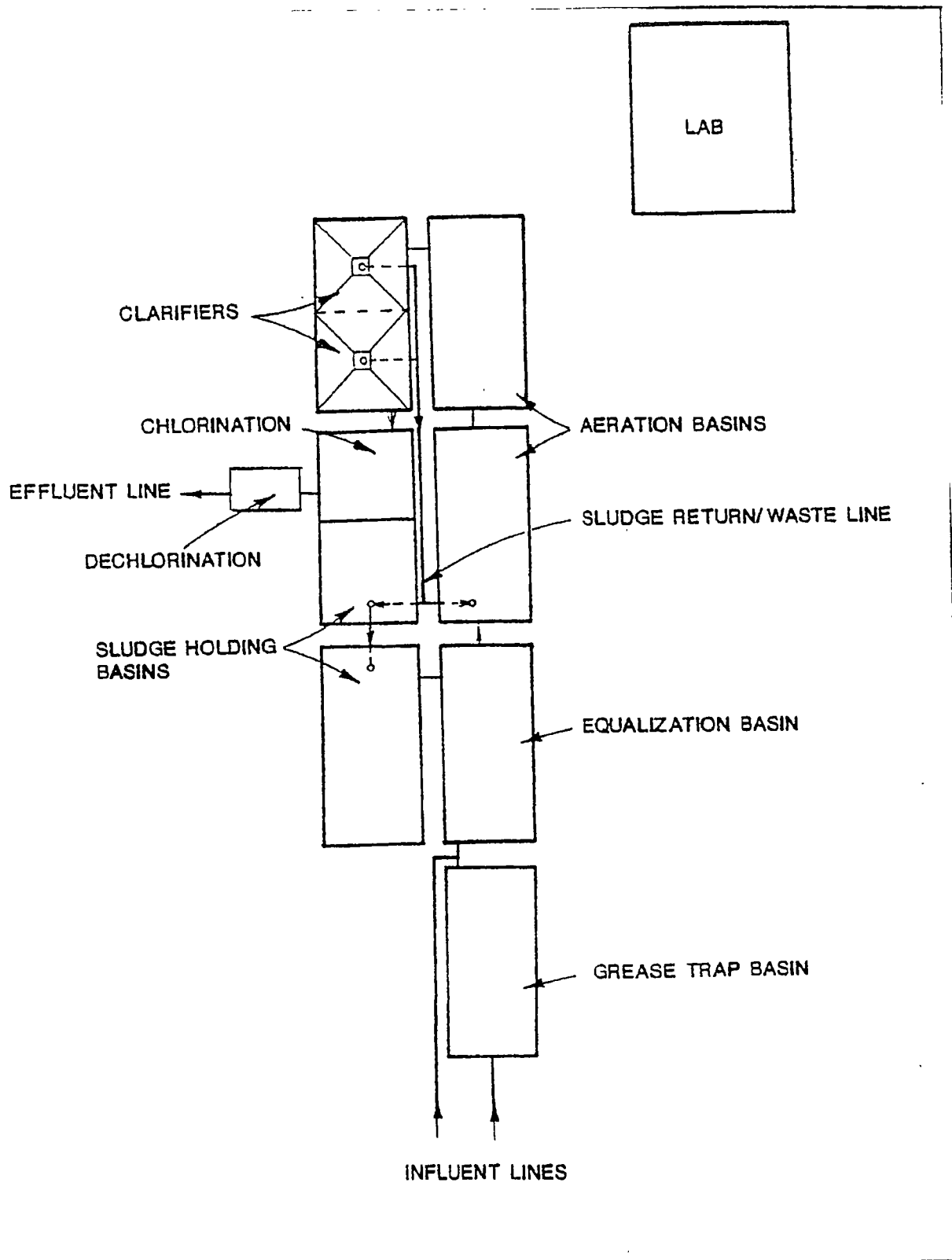
**North Spring Behavioral Healthcare WWTP**  
**Permit No. VA 0067938**  
**Flow Data (Sep 2011 -- Mar 2016)**

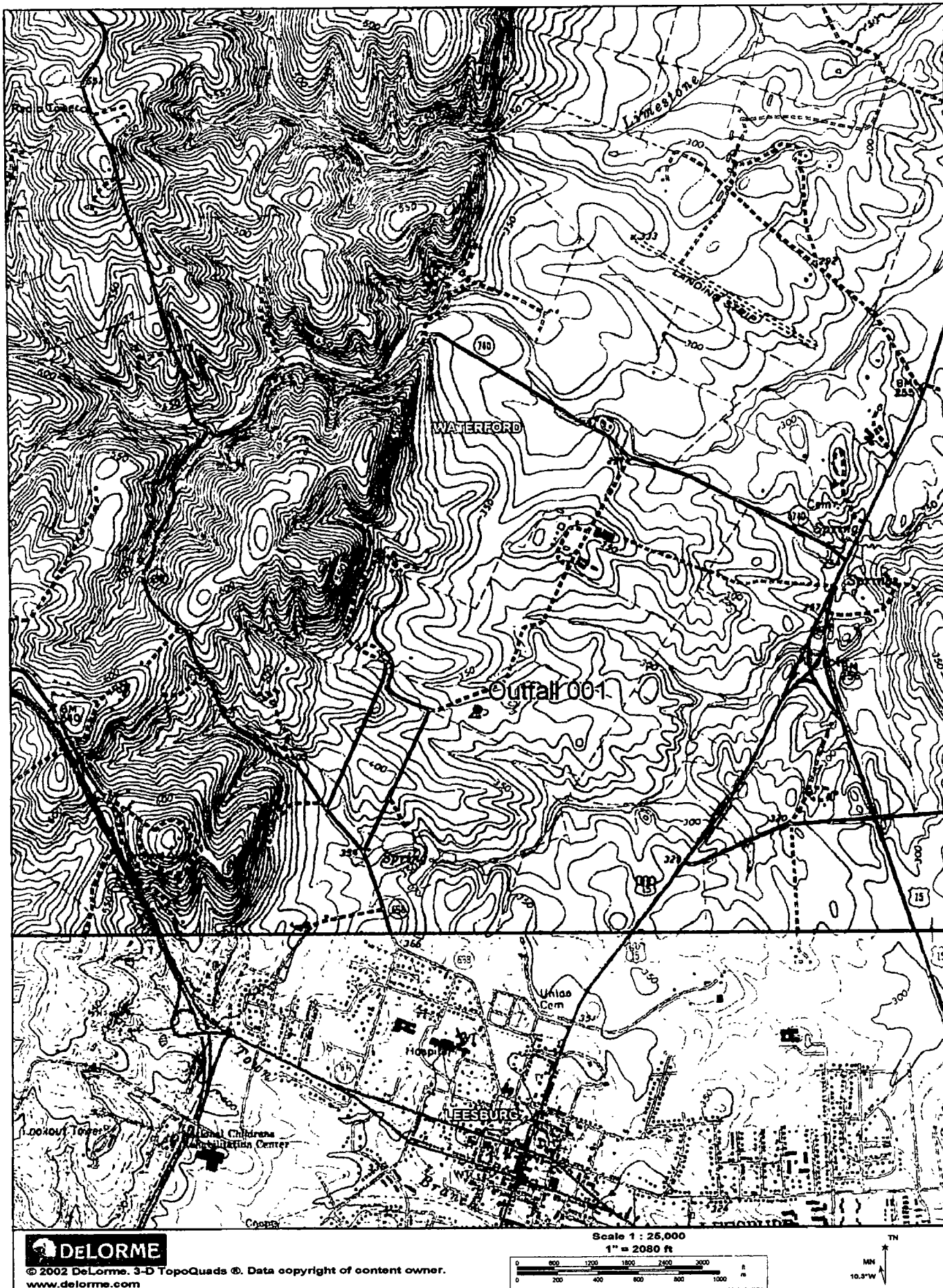
DMR Due Date	QTY AVG (MGD)	QTY MAX (MGD)
10-Oct-2011	0.009	0.019
10-Nov-2011	0.01	0.018
10-Dec-2011	0.009	0.015
10-Jan-2012	0.01	0.014
10-Feb-2012	0.009	0.014
10-Mar-2012	0.01	0.014
10-Apr-2012	0.01	0.018
10-May-2012	0.01	0.015
10-Jun-2012	0.009	0.015
10-Jul-2012	0.01	0.017
10-Aug-2012	0.009	0.016
10-Sep-2012	0.01	0.021
10-Oct-2012	0.01	0.015
10-Nov-2012	0.008	0.014
10-Dec-2012	0.008	0.014
10-Jan-2013	0.008	0.014
10-Feb-2013	0.008	0.014
10-Mar-2013	0.007	0.009
10-Apr-2013	0.009	0.016
10-May-2013	0.01	0.017
10-Jun-2013	0.008	0.013
10-Jul-2013	0.009	0.014
10-Aug-2013	0.011	0.018
10-Sep-2013	0.01	0.017
10-Oct-2013	0.013	0.032
10-Nov-2013	0.013	0.027
10-Dec-2013	0.013	0.021
10-Jan-2014	0.014	0.022
10-Feb-2014	0.013	0.021
10-Mar-2014	0.015	0.022
10-Apr-2014	0.017	0.121
10-May-2014	0.008	0.016
10-Jun-2014	0.009	0.02
10-Jul-2014	0.022	0.17
10-Aug-2014	0.01	0.017
10-Sep-2014	0.009	0.014
10-Oct-2014	0.018	0.012
10-Nov-2014	0.013	0.021
10-Dec-2014	0.011	0.02
10-Jan-2015	0.01	0.015
10-Feb-2015	0.011	0.016
10-Mar-2015	0.013	0.018
10-Apr-2015	0.0094	0.015
10-May-2015	0.0066	0.0152
10-Jun-2015	0.0033	0.0083
10-Jul-2015	0.00129	0.0049
10-Aug-2015	0.0082	0.0171
10-Sep-2015	0.011	0.022
10-Oct-2015	0.0118	0.0161
10-Nov-2015	0.0949	0.01352
10-Dec-2015	0.0057	0.0098
10-Jan-2016	0.0075	0.0202
10-Feb-2016	0.0073	0.0145
10-Mar-2016	0.0077	0.015
10-Apr-2016	0.0102	0.0167

Average Flow for Period  
Maximum Flow for Period  
Number of Maximum Values Greater than 0.016

0.011598

0.17  
25 46% of Maximum Flows







# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF ENVIRONMENTAL QUALITY

### NORTHERN REGIONAL OFFICE

13901 Crown Court, Woodbridge, Virginia 22193

(703) 583-3800 Fax (703) 583-3821

[www.deq.virginia.gov](http://www.deq.virginia.gov)

Douglas W. Domenech  
Secretary of Natural Resources

David K. Paylor  
Director

Thomas A. Faha  
Regional Director

August 27, 2013

Mr. David Winters  
Chief Executive Officer  
North Spring Behavioral Healthcare  
42009 Victory Lane  
Leesburg, VA 20176

**Re: North Spring Behavioral Health WWTP, Permit #VA0067938**

Dear Mr. Winters;

Attached is a copy of the Inspection Report generated from the Facility Technical Inspection conducted at North Spring Behavioral Healthcare – Wastewater Treatment Plant (WWTP) on July 24, 2013. This letter is not intended as a case decision under the Virginia Administrative Process Act, Va. Code § 2.2-4000 *et seq.* (APA). Additional inspections may be conducted to confirm that the facility is in compliance with permit requirements.

Please review the enclosed report and submit in writing adequate documentation of all measures taken (including all necessary supporting documentation) to address the Request for Corrective Action no later than **September 27, 2013**.

Your response may be sent either via the US Postal Service or electronically, via E-mail. If you choose to send your response electronically, we recommend sending it as an Acrobat PDF or in a Word-compatible, write-protected format. Additional inspections may be conducted to confirm that the facility is in compliance with permit requirements.

If you have any questions or comments concerning this report, please feel free to contact me at the Northern Regional Office at (703) 583-3882 or by e-mail at Sharon.Allen@deq.virginia.gov.

Sincerely,

A handwritten signature in black ink that reads "Sharon Allen". The script is cursive and fluid, with the first letter 'S' being particularly large and stylized.

Sharon Allen  
Environmental Specialist II

cc: Permits / DMR File

Electronic copy sent:

Compliance Manager, Compliance Auditor – DEQ  
Frank Stokes – Loudoun Water, Community Systems Manager  
Les Morefield – Loudoun Water, Community Systems Supervisor

**DEQ**  
**WASTEWATER FACILITY INSPECTION REPORT**  
 PREFACE

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date																								
<b>VA0067938</b>	<b>August 4, 2011</b>		<b>August 3, 2016</b>																								
Facility Name	Address		Telephone Number																								
<b>North Spring Behavioral Healthcare WWTP</b>	<b>42009 Victory Lane Leesburg, VA 20176</b>		<b>703-777-0800</b>																								
Owner Name	Address		Telephone Number																								
<b>Loudoun Water</b>	<b>42009 Victory Lane Leesburg, VA 20176</b>		<b>571-291-7878</b>																								
Responsible Official	Title		Telephone Number																								
<b>Mr. David Winters</b>	<b>Chief Executive Officer</b>		<b>703-777-0800</b>																								
Responsible Operator	Operator Cert. Class/number		Telephone Number																								
<b>Allen Nance</b>	<b>Class III / 1965008269</b>		<b>****</b>																								
TYPE OF FACILITY:																											
<table border="1" style="width: 100%;"> <tr> <th colspan="4">DOMESTIC</th> <th colspan="4">INDUSTRIAL</th> </tr> <tr> <td>Federal</td> <td></td> <td>Major</td> <td></td> <td>Major</td> <td></td> <td>Primary</td> <td></td> </tr> <tr> <td>Non-federal</td> <td><b>X</b></td> <td>Minor</td> <td><b>X</b></td> <td>Minor</td> <td></td> <td>Secondary</td> <td></td> </tr> </table>				DOMESTIC				INDUSTRIAL				Federal		Major		Major		Primary		Non-federal	<b>X</b>	Minor	<b>X</b>	Minor		Secondary	
DOMESTIC				INDUSTRIAL																							
Federal		Major		Major		Primary																					
Non-federal	<b>X</b>	Minor	<b>X</b>	Minor		Secondary																					
INFLUENT CHARACTERISTICS:																											
DESIGN:																											
	Flow MGD	<b>0.016</b>																									
	Population Served	<b>Variable</b>																									
	Connections Served	<b>Three</b>																									
	BOD <sub>5</sub> mg/L (Dec 2012 - Feb 2013)	<b>285</b>																									
	TSS mg/L ( Dec 2012 - Feb 2013)	<b>372</b>																									

EFFLUENT LIMITS:							
Parameter	Min.	Avg.	Max.	Parameter	Min.	Avg.	Max.
pH, s.u.	6.0		9.0	DO, mg/L	6.5		
BOD <sub>5</sub> , mg/L		15	22	TSS, mg/L		15	22
E. coli, n/cml		126		Ammonia-N, mg/L		1.3	1.3
TRC (Inst tech min), mg/L	0.6			TRC (post dechlorination), mg/L		.005	.010
TRC (Total Contact), mg/L	1.5						
	Receiving Stream			Limestone Branch, UT			
	Basin			Potomac River			
	Discharge Point (LONG)			77° 34' 04"			
	Discharge Point (LAT)			39° 08' 05"			

**Problems identified at last inspection: April 10, 2006**

**Corrected**

**Not Corrected**

**1. None Noted**

**[ ]**

**[ ]**

**SUMMARY - July 2013****Comments:**

- **This facility is required to meet reliability class I.**
- **The facility is installing a new water treatment plant (WTP) on site. While the WTP is being tested, no treatment chemicals were in used yet and the WTP was not yet in service. Filter water was being discharged to the grassy field behind the building. When completed, backwash water from the membrane filters will be discharged to the nearby lift station and then sent to the wastewater treatment plant. Excavation for the new line from the WTP to the lift station was in progress on the day of this inspection.**

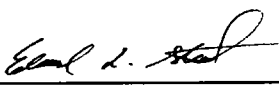
**REQUEST for CORRECTIVE ACTION:**

- **All staff who analyze samples for compliance reporting must complete an Initial Demonstration of Capability using the WTW 350i multimeter for pH and for both low and high range on the Pocket Colorimeter II for Total Residual Chlorine.**
- **The flow meter should be marked with the most recent date it was calibrated.**
- **Operators are not always notified about alarms at the WWTP by North Springs Staff. Because of this permit's requirement to meet Class I reliability, DEQ recommends that North Spring Staff be better aware of alarms at the WWTP and notify Loudoun Water promptly if lights or an alarm indicates a problem at the WWTP.**
- **The operation manual for the WTW 350i multimeter indicates that it can be calibrated using a one point, two point, or three point calibration. Operators have been using a 2 point calibration followed by a pH buffer 4 as a post calibration check. For the greatest accuracy and range, a 3 point calibration should be used, followed by a post calibration buffer check. Standard Methods SM4500-H+ B describes a three point calibration.**



Virginia Department of Environmental Quality

**FOCUSED CEI TECH/LAB INSPECTION REPORT**

<b>FACILITY NAME:</b> North Spring Behavioral Healthcare WWTP		<b>INSPECTION DATE:</b> July 24, 2013		
		<b>INSPECTOR:</b> S. Allen		
<b>PERMIT No.:</b> VA0067938		<b>REPORT DATE:</b> August 26, 2013		
<b>TYPE OF FACILITY:</b> <input checked="" type="checkbox"/> Municipal <input type="checkbox"/> Major <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Minor <input type="checkbox"/> Federal <input type="checkbox"/> Small Minor <input type="checkbox"/> HP <input type="checkbox"/> LP		<b>TIME OF INSPECTION:</b>	Arrival <b>1400</b>	Departure <b>1544</b>
		<b>TOTAL TIME SPENT (including prep &amp; travel)</b>	<b>20 hours</b>	
<b>PHOTOGRAPHS:</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>UNANNOUNCED INSPECTION?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<b>REVIEWED BY / Date:</b> <div align="center">  8/26/13         </div>				
<b>PRESENT DURING INSPECTION:</b> Les Morefield, , Allen Nance – Loudoun Water				

**TECHNICAL INSPECTION**

1. Has there been any new construction? • If so, were plans and specifications approved? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Is the Operations and Maintenance Manual approved and up-to-date? <u>Comments:</u> O&M Manual update received Sept 28, 2011 and approved Oct 17, 2011	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Are the Permit and/or Operation and Maintenance Manual specified licensed operator requirements being met? <u>Comments:</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4. Are the Permit and/or Operation and Maintenance Manual specified operator staffing requirements being met? <u>Comments:</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Is there an established and adequate program for training personnel? <u>Comments:</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6. Are preventive maintenance task schedules being met? <u>Comments:</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7. Does the plant experience any organic or hydraulic overloading? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
8. Have there been any bypassing or overflows since the last inspection? <u>Comments:</u> Operators stated that EQ tanks are adequate to contains flows from occasional pump failure or/and backups.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
9. Is the standby generator (including power transfer switch) operational and exercised regularly? <u>Comments:</u> Backup Generator is maintained by North Spring staff. Test run once a month.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
10. Is the plant alarm system operational and tested regularly? <u>Comments:</u> audio/visual alarms only.	<input type="checkbox"/> Yes <input type="checkbox"/> No

# VA DEQ Focused CEI Tech/Lab Inspection Report

Permit #	VA0067938
----------	-----------

## TECHNICAL INSPECTION

11. Is sludge disposed of in accordance with the approved sludge management plan? <u>Comments:</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
12. Is septage received? • If so, is septage loading controlled, and are appropriate records maintained? <u>Comments:</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
13. Are all plant records (operational logs, equipment maintenance, industrial waste contributors, sampling and testing) available for review and are records adequate? <u>Comments:</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
14. Which of the following records does the plant maintain? <input checked="" type="checkbox"/> Operational logs <input checked="" type="checkbox"/> Instrument maintenance & calibration <input checked="" type="checkbox"/> Mechanical equipment maintenance <input type="checkbox"/> Industrial Waste Contribution (Municipal facilities) <u>Comments:</u>	
15. What does the operational log contain? <input checked="" type="checkbox"/> Visual observations <input checked="" type="checkbox"/> Flow Measurement <input checked="" type="checkbox"/> Laboratory results <input checked="" type="checkbox"/> Process adjustments <input type="checkbox"/> Control calculations <input type="checkbox"/> Other (specify) _____ <u>Comments:</u>	
16. What do the mechanical equipment records contain? <input checked="" type="checkbox"/> As built plans and specs <input checked="" type="checkbox"/> Manufacturers instructions <input checked="" type="checkbox"/> Lubrication schedules <input type="checkbox"/> Spare parts inventory <input checked="" type="checkbox"/> Equipment/parts suppliers <input type="checkbox"/> Other (specify) _____ <u>Comments:</u>	
17. What do the industrial waste contribution records contain (Municipal only)? <input type="checkbox"/> Waste characteristics <input type="checkbox"/> Impact on plant <input type="checkbox"/> Locations and discharge types <input type="checkbox"/> Other (specify) <u>NA</u> <u>Comments:</u>	
18. Which of the following records are kept at the plant and available to personnel? <input checked="" type="checkbox"/> Equipment maintenance records <input checked="" type="checkbox"/> Operational log <input type="checkbox"/> Industrial contributor records <input checked="" type="checkbox"/> Instrumentation records <input checked="" type="checkbox"/> Sampling and testing records <u>Comments:</u>	
19. List records not normally available to plant personnel and their location: <u>Comments: None</u>	
20. Are the records maintained for the required time period (three or five years)? <u>Comments:</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

# VA DEQ Focused CEI Tech/Lab Inspection Report

Permit #	VA0067938
----------	-----------

## UNIT PROCESS EVALUATION SUMMARY SHEET

UNIT PROCESS	APPLICABLE	PROBLEMS*	COMMENTS
Sewage Pumping	Y		<i>Two lift stations on the property. Stations are maintained by North Spring staff.</i>
Flow Measurement (Influent)	Y		
Screening/Comminution	Y		
Flow Equalization	Y		
Activated Sludge Aeration	Y		<i>Two aeration basins in series.</i>
Secondary Sedimentation	Y		<i>One clarifier with two hopper bottoms.</i>
Chlorination	Y		<i>Liquid sodium hypochlorite – 12.5% diluted 6 gallons to 10 gallons H2O.</i>
Dechlorination	Y		<i>Sodium bisulfite tablets in a tablet feeder.</i>
Post Aeration	Y		
Flow Measurement (Effluent)	Y		<i>The effluent flow meter was calibrated May 30, 2013.</i>
Plant Outfall	Y		<i>Outfall 001 is located behind a house in a nearby neighborhood.</i>
Sludge Pumping	Y		
Aerobic Digestion	Y		<i>Sludge holding tank. Liquid sludge is pumped and hauled to Broad Run WRF.</i>

\* Problem Codes

- |                                  |  |
|----------------------------------|--|
| 1. Unit Needs Attention          | 4. Unapproved Modification or Temporary Repair |
| 2. Abnormal Influent/Effluent    | 5. Evidence of Process Upset                   |
| 3. Evidence of Equipment Failure | 6. Other (explain in comments)                 |

# VA DEQ Focused CEI Tech/Lab Inspection Report

Permit #

VA0067938

## INSPECTION OVERVIEW AND CONDITION OF TREATMENT UNITS

- Two influent lines feed into the plant - one from the kitchen, which enters a grease trap prior to the EQ basin, and one from the facility's two lift stations, which joins the influent line between the grease trap and the EQ basin.
- The grease trap and sludge holding tanks are cleaned/emptied out about once every three months. Wastewater is hauled to Broad Run WRF for disposal.
- There is one tank lying parallel to the EQ tank. On the O&M process flow diagram, this tank is labeled as a sludge holding basin; Mr. Nance said it is used as a second EQ tank if needed. Not currently in service.
- Water is pumped up from the EQ into the splitter box - some flow goes through V-notch weir and is screened before entering aeration basin, excess falls back into EQ tank. The EQ pumps were replaced in early spring 2013.
- Wastewater enters the aeration basins - two aeration basins in series. There are two blowers, one operating at a time. The lead blower is on for one and a half hours, then off for fifteen 15 minutes. The two blowers, alternate lead and lag with each new cycle. Mr. Nance said these are the original blowers for the WWTP.
- The clarifier is one tank with two hopper bottoms. The air lift return line runs back to the first aeration basin. Mr. Nance stated that they have had occasional breaks in the RAS line and these are fixed as soon as possible.
- The aeration basins and clarifier are covered to keep pine needles out of the treatment processes.
- Liquid sodium hypochlorite is fed to the clarifier effluent for disinfection. The hypochlorite is mixed with water in the control building and feeds into the clarifier effluent using a metering pump. Dechlorination is by sodium bisulfate tablets in a tablet feeder.
- Outfall 001 is located behind a house in a nearby neighborhood.
- The effluent flow meter was calibrated at the end of May 2013. The date calibrated on the flow meter is May 30, 2013. Operators have noted some problems with the readings; it was re-calibrated two weeks later. Operator said it seems accurate as of yesterday.
- This facility has audio/visual alarms only. North Spring staff do not often report alarms to Loudoun Water operators, they may not notice the alarms. The operators stated that the EQ basin has been sufficient to contain occasional backups caused by equipment failures.
- The backflow preventer was certified April 18, 2013.

# VA DEQ Focused CEI Tech/Lab Inspection Report

Permit #

VA0067938

## LABORATORY INSPECTION

**PRESENT DURING INSPECTION:**

**Allen Nance, Les Morefield- Loudoun Water**

1. Do lab records include sampling date/time, analysis date/time, sample location, test method, test results, analyst's initials, instrument calibration and maintenance, and Certificate of Analysis? <input checked="" type="checkbox"/> Sampling Date/Time <input checked="" type="checkbox"/> Analysis Date/Time <input checked="" type="checkbox"/> Sample Location <input checked="" type="checkbox"/> Test Method <input checked="" type="checkbox"/> Test Results <input checked="" type="checkbox"/> Analyst's Initials <input checked="" type="checkbox"/> Instrument Calibration & Maintenance <input type="checkbox"/> Chain of Custody <input type="checkbox"/> Certificate of Analysis	
2. Are Discharge Monitoring Reports complete and correct? Month(s) reviewed: _____ December 2012 - February 2013	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Are sample location(s) according to permit requirements (after all treatment unless otherwise specified)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4. Are sample collection, preservation, and holding times appropriate; and is sampling equipment adequate?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5. Are grab and composite samples representative of the flow and the nature of the monitored activity?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6. If analysis is performed at another location, are shipping procedures adequate? List parameters and name & address of contract lab(s):  <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>BOD5 &amp; TSS</b>  <b>Loudoun Water Regional Laboratory</b>  <b>VELAP ID 450115</b>  <b>44961 Loudoun Water Way</b>  <b>Ashburn, VA 20146</b> </div> <div style="width: 45%;"> <b>Ammonia-N</b>  <b>Microbac Laboratories</b>  <b>NELAC ID – 460022-1834</b>  <b>2101 Van Deman St</b>  <b>Baltimore, MD 21224</b>            and  <b>Martel Labs VELAP ID -460017</b>  <b>1025 Cromwell Bridge Rd.</b>  <b>Baltimore Maryland 21286</b> </div> </div> <p><b>Both Martel Laboratories and the Baltimore Division of Microbac have voluntarily given up environmental lab accreditation. Ammonia-N samples are currently sent to Pace Analytical Laboratories.</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Pace Analytical Services, Inc.</b>  <b>2225 Riverside Dr.</b>  <b>Ashville, NC 28804</b>  <b>(828) 254-7176</b> </div> <div style="width: 45%;"> <b>VELAP ID 460222</b> </div> </div>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7. Are annual thermometer calibration(s) adequate?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

## VA DEQ Focused CEI Tech/Lab Inspection Report

### 8. Parameters evaluated during this inspection (attach checklists):

- ☐ pH  
☐ Temperature  
☒ Total Residual Chlorine  
☒ Dissolved Oxygen  
☐ Biochemical Oxygen Demand  
☐ Total Suspended Solids  
☐ Other (specify) \_\_\_\_\_  
☐ Other (specify) \_\_\_\_\_  
☐ Other (specify) \_\_\_\_\_

#### Comments:

- The sample refrigerator temp was 4.0 at time of inspection; the NIST check was done on July 24, 2013. Correction factor +0.1 Deg C.

### EFFLUENT FIELD DATA:

Flow	9.8 GPM	Dissolved Oxygen	7.8 mg/L	TRC (Contact Tank)	8.8 mg/L
pH	7.85 S.U.	Temperature	24.0 °C	TRC (Final Effluent)	<QL mg/L
Was a Sampling Inspection conducted? <input type="checkbox"/> Yes (see Sampling Inspection Report) <input checked="" type="checkbox"/> No					

### CONDITION OF OUTFALL AND EFFLUENT CHARACTERISTICS:

1. Type of outfall:	<input checked="" type="checkbox"/> Shore based <input type="checkbox"/> Submerged   Diffuser? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Are the outfall and supporting structures in good condition?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3. Final Effluent (evidence of following problems):	<input type="checkbox"/> Sludge bar <input type="checkbox"/> Grease <input type="checkbox"/> Turbid effluent <input type="checkbox"/> Visible foam <input type="checkbox"/> Unusual color <input type="checkbox"/> Oil sheen
4. Is there a visible effluent plume in the receiving stream?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
5. Receiving stream:	<input checked="" type="checkbox"/> No observed problems <input type="checkbox"/> Indication of problems (explain below)
Comments:	

### REQUEST for CORRECTIVE ACTION:

1. Please see the Request for Corrective Action section at the beginning of this report.

ANALYST:	Allen Nance	VPDES NO	VA0067938
----------	-------------	----------	-----------

**Parameter: Total Residual Chlorine**  
**Method: DPD Colorimetric (HACH Pocket Colorimeter™)**  
**01/08**

Instrument: Pocket Colorimeter II

**METHOD OF ANALYSIS:**

HACH Manufacturer's Instructions ( Method 8167) plus an edition of Standard Methods

	18 <sup>th</sup> Edition of Standard Methods 4500-Cl G
<b>X</b>	21 <sup>st</sup> Edition of Standard Methods 4500-Cl G (00)

	Y	N
1) Is a certificate of operator competence or initial demonstration of capability available for each analyst/operator performing this analysis? NOTE: Analyze 4 samples of known TRC. Must use a lot number or source that is different from that used to prepare calibration standards. May not use SpecV™. [SM 1020 B.1]		<b>X</b>
2) Are the DPD PermaChem® Powder Pillows stored in a cool, dry place? [Mfr.]	<b>X</b>	
3) Are the pillows within the manufacturer's expiration date? [Mfr.]	<b>X</b>	
4) Has buffering capability of DPD pillows been checked annually? (Pillows should adjust sample pH to between 6 and 7) [Mfr.]	<b>X</b>	
5) When pH adjustment is required, is H <sub>2</sub> SO <sub>4</sub> or NaOH used? [11.3.1]	<b>X</b>	
6) Are cells clean and in good condition? [Mfr.]	<b>X</b>	
7) Is the low range (0.01-mg/L resolution) used for samples containing residuals from 0-2.00 mg/L? [Mfr.]	<b>X</b>	
8) Is calibration curve developed (may use manufacturer's calibration) with daily verification using a high and a low standard? NOTE: May use manufacturer's installed calibration and commercially available chlorine standards for daily calibration verifications. [18th ed 1020 B.5; 21st ed 4020 B.2.b]	<b>X</b>	
9) Is the 10-mL cell (2.5-cm diameter) used for samples from 0-2.00 mg/L? [Mfr.]	<b>X</b>	
10) Is the meter zeroed correctly by using sample as blank for the cell used? [Mfr.]	<b>X</b>	
11) Is the instrument cap placed correctly on the meter body when the meter is zeroed and when the sample is analyzed? [Mfr.]	<b>X</b>	
12) Is the DPD Total Chlorine PermaChem® Powder Pillow mixed into the sample? [HACH 11.1]	<b>X</b>	
13) Is the analysis made at least three minutes but not more than six minutes after PermaChem® Powder Pillow addition? [11.2]	<b>X</b>	
14) If read-out is flashing [2.20], is sample diluted correctly, then reanalyzed? [1.2 & 2.0]	<b>X</b>	
15) Are samples analyzed within 15 minutes of collection? [40 CFR Part 136]	<b>X</b>	

COMMENTS:	<b>14) Samples from the chlorine contact tank are usually read in High Range; final effluent samples collected after dechlorination are read on low range.</b>
PROBLEMS:	<b>None Noted</b>

ANALYST:	Allen Nance	VPDES NO	VA0067938
----------	-------------	----------	-----------

**Parameter: Hydrogen Ion (pH)**  
**Method: Electrometric**  
**01/08**

Meter: WTW 350i multimeter

**METHOD OF ANALYSIS**

	18 <sup>th</sup> Edition of Standard Methods-4500-H-B
<b>X</b>	22 <sup>st</sup> or On-Line Edition of Standard Methods-4500-H-B (00)

**pH is a method defined analyte so modifications are not allowed. [40 CFR Part 136.6]**

- 1) Is a certificate of operator competence or initial demonstration of capability available for each analyst/operator performing the analysis? **NOTE:** Analyze 4 samples of known pH. May use external source of buffer (different lot/manufacturer than buffers used to calibrate meter). Recovery for each of the 4 samples must be  $\pm 0.1$  SU of the known concentration of the sample. [SM 1020 B.1]
- 2) Is the electrode in good condition (no chloride precipitate, etc.)? [2.b/c and 5.b]
- 3) Is electrode storage solution in accordance with manufacturer's instructions? [Mfr.]
- 4) Is meter calibrated on at least a daily basis using three buffers all of which are at the same temperature? [4.a] **NOTE:** Follow manufacturer's instructions.
- 5) After calibration, is a buffer analyzed as a check sample to verify that calibration is correct? Agreement should be within  $\pm 0.1$  SU. [4.a]
- 6) Do the buffer solutions appear to be free of contamination or growths? [3.1]
- 7) Are buffer solutions within their listed shelf life or have they been prepared within the last 4 weeks? [3.a]
- 8) Is the cap or sleeve covering the access hole on the reference electrode removed when measuring pH? [Mfr.]
- 9) For meters with ATC that also have temperature display, was the thermometer calibrated annually? [SM2550 B.1]
- 10) Is the temperature of buffer solutions and samples recorded when determining pH? [4.a]
- 11) Is sample analyzed within 15 minutes of collection? [40 CFR 136.6]
- 12) Was the electrode rinsed and then blotted dry between reading solutions (Disregard if a portion of the next sample analyzed is used as the rinse solution)? [4.a]
- 13) Is the sample stirred gently at a constant speed during measurement? [4.b]
- 14) Does the meter hold a steady reading after reaching equilibrium? [4.b]
- 15) Is a duplicate sample analyzed after every 20 samples if citing 18<sup>th</sup> or 19<sup>th</sup> Edition [1020 B.6] or daily for 20<sup>th</sup> or 21<sup>st</sup> Edition [Part 1020] Note: Not required for *in situ* samples.
- 16) Is pH of duplicate samples within 0.1 SU of the original sample? [Part 1020]
- 17) Is there a written procedure for which result will be reported on DMR (Sample or Duplicate) and is this procedure followed? [DEQ]

Y	N
	<b>X</b>
<b>X</b>	
<b>X</b>	
<b>X</b>	
<b>X</b>	
<b>X</b>	
<b>X</b>	
<b>X</b>	
<b>X</b>	
<b>In Situ</b>	
<b>X</b>	
<b>In Situ</b>	
<b>X</b>	
<b>NA</b>	
<b>NA</b>	
<b>NA</b>	

PROBLEMS:	<b>1) All staff who analyzes samples for compliance reporting must complete an Initial Demonstration of Capability using the WTW 350i multimeter</b>
-----------	--



ANALYST:	Allen Nance	VPDES NO.	VA0067938
----------	-------------	-----------	-----------

**Parameter: Dissolved Oxygen**  
**Method: Electrode**  
**01/08**

Meter: **WTW 350i multimeter**

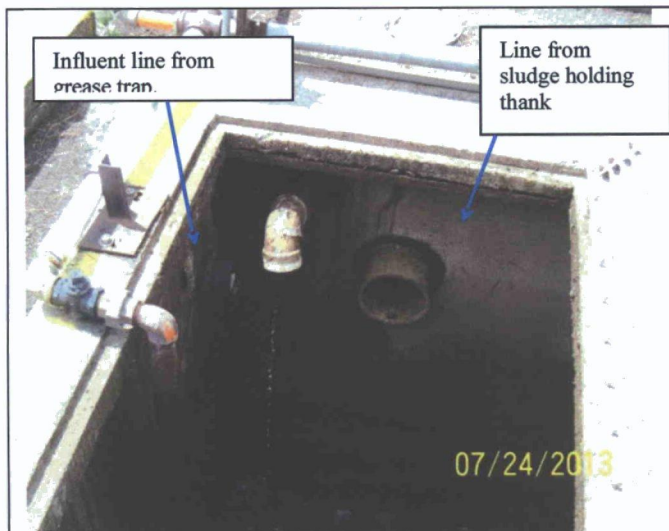
**METHOD OF ANALYSIS:**

	18 <sup>th</sup> Edition of Standard Methods-4500-O G
<b>X</b>	22 <sup>st</sup> or Online Editions of Standard Methods-4500-O G (01)

**DO is a method defined analyte so modifications are not allowed. [40 CFR Part 136.6]**

	Y	N
	<b>In situ</b>	
1) If samples are collected, is collection carried out with a minimum of turbulence and air bubble formation and is the sample bottle allowed to overflow several times its volume? [B.3]	<b>X</b>	
2) Are meter and electrode operable and providing consistent readings? [3]	<b>X</b>	
3) Is membrane in good condition without trapped air bubbles? [3.b]	<b>X</b>	
4) Is correct filling solution used in electrode? [Mfr.]	<b>X</b>	
5) Are water droplets shaken off the membrane prior to calibration? [Mfr.]	<b>X</b>	
6) Is meter calibrated before use or at least daily? [Mfr.]	<b>X</b>	
7) Is calibration procedure performed according to manufacturer's instructions? [Mfr.]	<b>X</b>	
8) Is sample stirred during analysis? [Mfr.]	<b>In situ</b>	
9) Is the sample analysis procedure performed according to manufacturer's instructions? [Mfr.]	<b>X</b>	
10) Is meter stabilized before reading D.O.? [Mfr.]	<b>X</b>	
11) Is electrode stored according to manufacturer's instructions? [Mfr.]	<b>X</b>	
12) Is a duplicate sample analyzed after every 20 samples if citing 18 <sup>th</sup> or 19 <sup>th</sup> Edition [1020 B.6] or daily if citing 20 <sup>th</sup> or 21 <sup>st</sup> Edition [Part 1020] Note: Not required for <i>in situ</i> samples.	<b>NA</b>	
13) If a duplicate sample is analyzed, is the reported value for that sampling event, the average concentration of the sample and the duplicate? [DEQ]	<b>NA</b>	
14) If a duplicate sample is analyzed, is the relative percent difference (RPD) < 20? [18 <sup>th</sup> ed. Table 1020 I; 21 <sup>st</sup> ed. DEQ]	<b>NA</b>	

PROBLEMS:	<b>None Noted</b>
-----------	-------------------



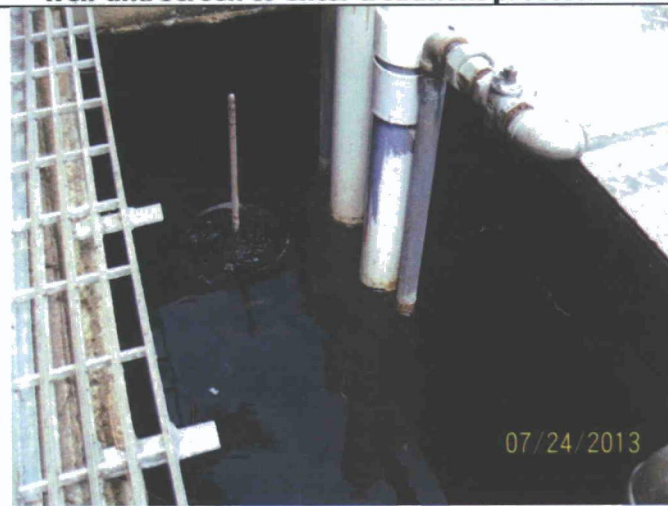
1) Lines into EQ tank.



2) Flow from EQ splitter box going through V-notch weir and screen to enter treatment process.



3) First of two aeration basins.



4) Surface of clarifier.

Facility name: North Spring Behavioral WWTP  
Site Inspection Date: June 24, 2013

VPDES Permit No. VA0067938  
Photos & Layout by: S. Allen



**1) Clarifier weir and discharge to post aeration/chlorination.**



**2) Sodium bisulfite tablet feeder.**



**3) Outfall 001**



**4) Downstream from Outfall 001.**

**Facility name: North Spring Behavioral WWTP**  
**Site Inspection Date: June 24, 2013**

**VPDES Permit No. VA0067938**  
**Photos & Layout by: S. Allen**

To: Douglas Frasier  
From: Rebecca Shoemaker

Date: 27 April 2016  
Subject: Planning Statement for North Spring Behavioral Healthcare  
Permit Number: VA0067938

**Information for Outfall 001:**

Discharge Type:	minor, municipal
Discharge Flow:	0.016 MGD
Receiving Stream:	Limestone Branch, UT
Latitude / Longitude:	39° 08' 56" / 77° 32' 52"
Rivermile:	1.33
Streamcode:	1aXGJ
Waterbody:	VAN-A03R; PL05
Water Quality Standards:	Class III, Section 8, special standards PWS
Drainage Area:	0 square miles

1. Please provide water quality monitoring information for the receiving stream segment. If there is not monitoring information for the receiving stream segment, please provide information on the nearest downstream monitoring station, including how far downstream the monitoring station is from the outfall.

This facility discharges to an unnamed tributary to Limestone Branch (streamcode XGJ). DEQ ambient monitoring station 1aXGJ000.42 is located at Selma Lane, approximately 0.91 mile downstream from this facility. The following is the water quality summary for this segment of the unnamed tributary to Limestone Branch, as taken from the draft 2014 Integrated Report:

*Class III, Section 8, special stds. PWS.*

*DEQ monitoring stations located in this segment of Rapidan River:*

- *ambient water quality monitoring station 1aXGJ000.42, at Selma Lane*

*E. coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. This impairment is nested within the downstream completed bacteria TMDL for Limestone Branch.*

*The aquatic life and wildlife uses are considered fully supporting. Citizen monitoring had previously noted a medium probability of adverse conditions for biota, resulting in an observed effects for the aquatic life use. The observed effect will remain.*

*The fish consumption and public water supply uses were not assessed.*

2. Does this facility discharge to a stream segment on the 303(d) list? If yes, please fill out Table A.

Yes.

**Table A. 303(d) Impairment and TMDL information for the receiving stream segment**

Waterbody Name	Impaired Use	Cause	TMDL completed	WLA	Basis for WLA	TMDL Schedule
<b><i>Impairment Information in the Draft 2014 Integrated Report</i></b>						
Limestone Branch, UT	Recreation	<i>E. coli</i>	Limestone Branch Bacteria EPA Approval: 07/06/2004 (Original TMDL) 03/10/2010 (Modification)	2.79E+10 cfu/year <i>E. coli</i> *	126 cfu/100 ml <i>E. coli</i> --- 0.016 MGD*	---

\*The WLA is based on a modification to the TMDL to account for a revised design flow for this facility of 0.016 MGD. The original TMDL document provided a WLA of 1.74E+10 cfu/100 ml *E. coli* bacteria based on the facility's original design flow of 0.01 MGD.

3. Are there any downstream 303(d) listed impairments that are relevant to this discharge? If yes, please fill out Table B.

No.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

There is a completed downstream TMDL for the aquatic life use impairment for the Chesapeake Bay. However, the Bay TMDL and the WLAs contained within the TMDL are not addressed in this planning statement.

5. Fact Sheet Requirements – Please provide information regarding any drinking water intakes located within a 5 mile radius of the discharge point.

There is one drinking water intake for the Town of Leesburg located within a five mile radius of Outfall 001.

# FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

## Attachment 8

Facility Name. North Spring Behavioral Health

Permit No. VA0067938

Receiving Stream. Limestone Branch, UT

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information		Stream Flows		Mixing Information		Effluent Information	
Mean Hardness (as CaCO <sub>3</sub> ) =	mg/L	1Q10 (Annual) =	0 MGD	Annual - 1Q10 Mix =	100 %	Mean Hardness (as CaCO <sub>3</sub> ) =	50 mg/L
90% Temperature (Annual) =	deg C	7Q10 (Annual) =	0 MGD	- 7Q10 Mix =	100 %	90% Temp (Annual) =	25 deg C
90% Temperature (Wet season) =	deg C	30Q10 (Annual) =	0 MGD	- 30Q10 Mix =	100 %	90% Temp (Wet season) =	15 deg C
90% Maximum pH =	SU	1Q10 (Wet season) =	0 MGD	Wet Season - 1Q10 Mix =	100 %	90% Maximum pH =	8.4 SU
10% Maximum pH =	SU	30Q10 (Wet season) =	0 MGD	- 30Q10 Mix =	100 %	10% Maximum pH =	SU
Tier Designation (1 or 2) =	1	30Q5 =	0 MGD			Discharge Flow =	0.016 MGD
Public Water Supply (PWS) Y/N? =	y	Harmonic Mean =	0 MGD				
Trout Present Y/N? =	n						
Early Life Stages Present Y/N? =	y						

Parameter (ug/l unless noted)	Background Conc	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenaphthene	0	--	--	6.7E+02	9.9E+02	--	--	6.7E+02	9.9E+02	--	--	--	--	--	--	--	--	--	--	6.7E+02	9.9E+02
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	6.1E+00	9.3E+00	--	--	--	--	--	--	--	--	--	--	6.1E+00	9.3E+00
Acrylonitrile <sup>c</sup>	0	--	--	5.1E-01	2.5E+00	--	--	5.1E-01	2.5E+00	--	--	--	--	--	--	--	--	--	--	5.1E-01	2.5E+00
Aldrin <sup>c</sup>	0	3.0E+00	--	4.9E-04	5.0E-04	3.0E+00	--	4.9E-04	5.0E-04	--	--	--	--	--	--	--	--	3.0E+00	--	4.9E-04	5.0E-04
Ammonia-N (mg/l) (Yearly)	0	3.88E+00	6.56E-01	--	--	3.88E+00	6.56E-01	--	--	--	--	--	--	--	--	--	--	3.88E+00	6.56E-01	--	--
Ammonia-N (mg/l) (High Flow)	0	3.88E+00	1.25E+00	--	--	3.88E+00	1.25E+00	--	--	--	--	--	--	--	--	--	--	3.88E+00	1.25E+00	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	8.3E+03	4.0E+04	--	--	--	--	--	--	--	--	--	--	8.3E+03	4.0E+04
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	5.6E+00	6.4E+02	--	--	--	--	--	--	--	--	--	--	5.6E+00	6.4E+02
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	3.4E+02	1.5E+02	1.0E+01	--	--	--	--	--	--	--	--	--	3.4E+02	1.5E+02	1.0E+01	--
Banum	0	--	--	2.0E+03	--	--	--	2.0E+03	--	--	--	--	--	--	--	--	--	--	--	2.0E+03	--
Benzene <sup>c</sup>	0	--	--	2.2E+01	5.1E+02	--	--	2.2E+01	5.1E+02	--	--	--	--	--	--	--	--	--	--	2.2E+01	5.1E+02
Benzidine <sup>c</sup>	0	--	--	8.6E-04	2.0E-03	--	--	8.6E-04	2.0E-03	--	--	--	--	--	--	--	--	--	--	8.6E-04	2.0E-03
Benzo (a) anthracene <sup>c</sup>	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	--	--	3.8E-02	1.8E-01
Benzo (b) fluoranthene <sup>c</sup>	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	--	--	3.8E-02	1.8E-01
Benzo (k) fluoranthene <sup>c</sup>	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	--	--	3.8E-02	1.8E-01
Benzo (a) pyrene <sup>c</sup>	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	--	--	3.8E-02	1.8E-01
Bis(2-Chloroethyl) Ether <sup>c</sup>	0	--	--	3.0E-01	5.3E+00	--	--	3.0E-01	5.3E+00	--	--	--	--	--	--	--	--	--	--	3.0E-01	5.3E+00
Bis(2-Chloroisopropyl) Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.4E+03	6.5E+04	--	--	--	--	--	--	--	--	--	--	1.4E+03	6.5E+04
Bis(2-Ethylhexyl) Phthalate <sup>c</sup>	0	--	--	1.2E+01	2.2E+01	--	--	1.2E+01	2.2E+01	--	--	--	--	--	--	--	--	--	--	1.2E+01	2.2E+01
Bromoform <sup>c</sup>	0	--	--	4.3E+01	1.4E+03	--	--	4.3E+01	1.4E+03	--	--	--	--	--	--	--	--	--	--	4.3E+01	1.4E+03
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.5E+03	1.9E+03	--	--	--	--	--	--	--	--	--	--	1.5E+03	1.9E+03
Cadmium	0	1.8E+00	6.6E-01	5.0E+00	--	1.8E+00	6.6E-01	5.0E+00	--	--	--	--	--	--	--	--	--	1.8E+00	6.6E-01	5.0E+00	--
Carbon Tetrachloride <sup>c</sup>	0	--	--	2.3E+00	1.6E+01	--	--	2.3E+00	1.6E+01	--	--	--	--	--	--	--	--	--	--	2.3E+00	1.6E+01
Chlordane <sup>c</sup>	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	2.4E+00	4.3E-03	8.0E-03	8.1E-03	--	--	--	--	--	--	--	--	2.4E+00	4.3E-03	8.0E-03	8.1E-03
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	8.6E+05	2.3E+05	2.5E+05	--	--	--	--	--	--	--	--	--	8.6E+05	2.3E+05	2.5E+05	--
TRC	0	1.9E+01	1.1E+01	--	--	1.9E+01	1.1E+01	--	--	--	--	--	--	--	--	--	--	1.9E+01	1.1E+01	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.3E+02	1.6E+03	--	--	--	--	--	--	--	--	--	--	1.3E+02	1.6E+03



Parameter (ug/l unless noted)	Background Conc	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane <sup>C</sup>	0	--	--	4.0E+00	1.3E+02	--	--	4.0E+00	1.3E+02	--	--	--	--	--	--	--	--	--	--	4.0E+00	1.3E+02
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	3.4E+02	1.1E+04	--	--	--	--	--	--	--	--	--	--	3.4E+02	1.1E+04
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	1.0E+03	1.6E+03	--	--	--	--	--	--	--	--	--	--	1.0E+03	1.6E+03
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	8.1E+01	1.5E+02	--	--	--	--	--	--	--	--	--	--	8.1E+01	1.5E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	8.3E-02	4.1E-02	--	--	--	--	--	--	--	--	--	--	8.3E-02	4.1E-02	--	--
Chromium III	0	3.2E+02	4.2E+01	--	--	3.2E+02	4.2E+01	--	--	--	--	--	--	--	--	--	--	3.2E+02	4.2E+01	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	1.6E+01	1.1E+01	--	--	--	--	--	--	--	--	--	--	1.6E+01	1.1E+01	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	1.0E+02	--	--	--	--	--	--	--	--	--	--	--	1.0E+02	--
Chrysene <sup>C</sup>	0	--	--	3.8E-03	1.8E-02	--	--	3.8E-03	1.8E-02	--	--	--	--	--	--	--	--	--	--	3.8E-03	1.8E-02
Copper	0	7.0E+00	5.0E+00	1.3E+03	--	7.0E+00	5.0E+00	1.3E+03	--	--	--	--	--	--	--	--	--	7.0E+00	5.0E+00	1.3E+03	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	2.2E+01	5.2E+00	1.4E+02	1.6E+04	--	--	--	--	--	--	--	--	2.2E+01	5.2E+00	1.4E+02	1.6E+04
DDD <sup>C</sup>	0	--	--	3.1E-03	3.1E-03	--	--	3.1E-03	3.1E-03	--	--	--	--	--	--	--	--	--	--	3.1E-03	3.1E-03
DDE <sup>C</sup>	0	--	--	2.2E-03	2.2E-03	--	--	2.2E-03	2.2E-03	--	--	--	--	--	--	--	--	--	--	2.2E-03	2.2E-03
DDT <sup>C</sup>	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	1.1E+00	1.0E-03	2.2E-03	2.2E-03	--	--	--	--	--	--	--	--	1.1E+00	1.0E-03	2.2E-03	2.2E-03
Demeton	0	--	1.0E-01	--	--	--	1.0E-01	--	--	--	--	--	--	--	--	--	--	--	1.0E-01	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	1.7E-01	1.7E-01	--	--	--	--	--	--	--	--	--	--	1.7E-01	1.7E-01	--	--
Dibenz(a,h)anthracene <sup>C</sup>	0	--	--	3.8E-02	1.8E-01	--	--	3.8E-02	1.8E-01	--	--	--	--	--	--	--	--	--	--	3.8E-02	1.8E-01
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	4.2E+02	1.3E+03	--	--	--	--	--	--	--	--	--	--	4.2E+02	1.3E+03
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	3.2E+02	9.6E+02	--	--	--	--	--	--	--	--	--	--	3.2E+02	9.6E+02
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	6.3E+01	1.9E+02	--	--	--	--	--	--	--	--	--	--	6.3E+01	1.9E+02
3,3-Dichlorobenzidine <sup>C</sup>	0	--	--	2.1E-01	2.8E-01	--	--	2.1E-01	2.8E-01	--	--	--	--	--	--	--	--	--	--	2.1E-01	2.8E-01
Dichlorobromomethane <sup>C</sup>	0	--	--	5.5E+00	1.7E+02	--	--	5.5E+00	1.7E+02	--	--	--	--	--	--	--	--	--	--	5.5E+00	1.7E+02
1,2-Dichloroethane <sup>C</sup>	0	--	--	3.8E+00	3.7E+02	--	--	3.8E+00	3.7E+02	--	--	--	--	--	--	--	--	--	--	3.8E+00	3.7E+02
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	3.3E+02	7.1E+03	--	--	--	--	--	--	--	--	--	--	3.3E+02	7.1E+03
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.4E+02	1.0E+04	--	--	--	--	--	--	--	--	--	--	1.4E+02	1.0E+04
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	7.7E+01	2.9E+02	--	--	--	--	--	--	--	--	--	--	7.7E+01	2.9E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	1.0E+02	--	--	--	--	--	--	--	--	--	--	--	1.0E+02	--
1,2-Dichloropropane <sup>C</sup>	0	--	--	5.0E+00	1.5E+02	--	--	5.0E+00	1.5E+02	--	--	--	--	--	--	--	--	--	--	5.0E+00	1.5E+02
1,3-Dichloropropene <sup>C</sup>	0	--	--	3.4E+00	2.1E+02	--	--	3.4E+00	2.1E+02	--	--	--	--	--	--	--	--	--	--	3.4E+00	2.1E+02
Dieldrin <sup>C</sup>	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	2.4E-01	5.6E-02	5.2E-04	5.4E-04	--	--	--	--	--	--	--	--	2.4E-01	5.6E-02	5.2E-04	5.4E-04
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.7E+04	4.4E+04	--	--	--	--	--	--	--	--	--	--	1.7E+04	4.4E+04
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	3.8E+02	8.5E+02	--	--	--	--	--	--	--	--	--	--	3.8E+02	8.5E+02
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.7E+05	1.1E+06	--	--	--	--	--	--	--	--	--	--	2.7E+05	1.1E+06
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	2.0E+03	4.5E+03	--	--	--	--	--	--	--	--	--	--	2.0E+03	4.5E+03
2,4-Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	6.9E+01	5.3E+03	--	--	--	--	--	--	--	--	--	--	6.9E+01	5.3E+03
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.3E+01	2.8E+02	--	--	--	--	--	--	--	--	--	--	1.3E+01	2.8E+02
2,4-Dinitrotoluene <sup>C</sup>	0	--	--	1.1E+00	3.4E+01	--	--	1.1E+00	3.4E+01	--	--	--	--	--	--	--	--	--	--	1.1E+00	3.4E+01
Dioxin 2,3,7,8- tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	5.0E-08	5.1E-08	--	--	--	--	--	--	--	--	--	--	5.0E-08	5.1E-08
1,2-Diphenylhydrazine <sup>C</sup>	0	--	--	3.6E-01	2.0E+00	--	--	3.6E-01	2.0E+00	--	--	--	--	--	--	--	--	--	--	3.6E-01	2.0E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.2E-01	5.6E-02	6.2E+01	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	6.2E+01	8.9E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	2.2E-01	5.6E-02	6.2E+01	8.9E+01	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	6.2E+01	8.9E+01
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	2.2E-01	5.6E-02	--	--	--	--	--	--	--	--	--	--	2.2E-01	5.6E-02	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	6.2E+01	8.9E+01	--	--	--	--	--	--	--	--	--	--	6.2E+01	8.9E+01
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	8.6E-02	3.6E-02	5.9E-02	6.0E-02	--	--	--	--	--	--	--	--	8.6E-02	3.6E-02	5.9E-02	6.0E-02
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.9E-01	3.0E-01	--	--	--	--	--	--	--	--	--	--	2.9E-01	3.0E-01

Parameter (ug/l unless noted)	Background Conc	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5 3E+02	2 1E+03	--	--	5 3E+02	2 1E+03	--	--	--	--	--	--	--	--	--	--	5.3E+02	2.1E+03
Fluoranthene	0	--	--	1 3E+02	1 4E+02	--	--	1 3E+02	1 4E+02	--	--	--	--	--	--	--	--	--	--	1.3E+02	1.4E+02
Fluorene	0	--	--	1 1E+03	5 3E+03	--	--	1 1E+03	5 3E+03	--	--	--	--	--	--	--	--	--	--	1 1E+03	5.3E+03
Foaming Agents	0	--	--	5 0E+02	--	--	--	5 0E+02	--	--	--	--	--	--	--	--	--	--	--	5.0E+02	--
Guthion	0	--	1 0E-02	--	--	--	1 0E-02	--	--	--	--	--	--	--	--	--	--	--	1.0E-02	--	--
Heptachlor <sup>C</sup>	0	5 2E-01	3 8E-03	7 9E-04	7 9E-04	5 2E-01	3 8E-03	7 9E-04	7 9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	7.9E-04	7.9E-04
Heptachlor Epoxide <sup>C</sup>	0	5 2E-01	3 8E-03	3 9E-04	3 9E-04	5 2E-01	3 8E-03	3 9E-04	3 9E-04	--	--	--	--	--	--	--	--	5.2E-01	3.8E-03	3.9E-04	3.9E-04
Hexachlorobenzene <sup>C</sup>	0	--	--	2 8E-03	2 9E-03	--	--	2 8E-03	2 9E-03	--	--	--	--	--	--	--	--	--	--	2.8E-03	2.9E-03
Hexachlorobutadiene <sup>C</sup>	0	--	--	4 4E+00	1 8E+02	--	--	4 4E+00	1 8E+02	--	--	--	--	--	--	--	--	--	--	4.4E+00	1.8E+02
Hexachlorocyclohexane Alpha-BHC <sup>C</sup>	0	--	--	2 6E-02	4 9E-02	--	--	2 6E-02	4 9E-02	--	--	--	--	--	--	--	--	--	--	2.6E-02	4.9E-02
Hexachlorocyclohexane Beta-BHC <sup>C</sup>	0	--	--	9 1E-02	1 7E-01	--	--	9 1E-02	1 7E-01	--	--	--	--	--	--	--	--	--	--	9.1E-02	1.7E-01
Hexachlorocyclohexane Gamma-BHC <sup>C</sup> (Lindane)	0	9 5E-01	--	9 8E-01	1 8E+00	9 5E-01	--	9 8E-01	1 8E+00	--	--	--	--	--	--	--	--	9.5E-01	--	9.8E-01	1.8E+00
Hexachlorocyclopentadiene	0	--	--	4 0E+01	1 1E+03	--	--	4 0E+01	1 1E+03	--	--	--	--	--	--	--	--	--	--	4.0E+01	1.1E+03
Hexachloroethane <sup>C</sup>	0	--	--	1 4E+01	3 3E+01	--	--	1 4E+01	3 3E+01	--	--	--	--	--	--	--	--	--	--	1.4E+01	3.3E+01
Hydrogen Sulfide	0	--	2 0E+00	--	--	--	2 0E+00	--	--	--	--	--	--	--	--	--	--	--	2 0E+00	--	--
Indeno (1,2,3-cd) pyrene <sup>C</sup>	0	--	--	3 8E-02	1 8E-01	--	--	3 8E-02	1 8E-01	--	--	--	--	--	--	--	--	--	--	3.8E-02	1.8E-01
Iron	0	--	--	3 0E+02	--	--	--	3 0E+02	--	--	--	--	--	--	--	--	--	--	--	3.0E+02	--
Isophorone <sup>C</sup>	0	--	--	3 5E+02	9 6E+03	--	--	3 5E+02	9 6E+03	--	--	--	--	--	--	--	--	--	--	3.5E+02	9.6E+03
Kepone	0	--	0 0E+00	--	--	--	0 0E+00	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	--	--
Lead	0	4 9E+01	5 6E+00	1 5E+01	--	4 9E+01	5 6E+00	1 5E+01	--	--	--	--	--	--	--	--	--	4.9E+01	5.6E+00	1.5E+01	--
Malathion	0	--	1 0E-01	--	--	--	1 0E-01	--	--	--	--	--	--	--	--	--	--	--	1.0E-01	--	--
Manganese	0	--	--	5 0E+01	--	--	--	5 0E+01	--	--	--	--	--	--	--	--	--	--	--	5.0E+01	--
Mercury	0	1 4E+00	7 7E-01	--	--	1 4E+00	7 7E-01	--	--	--	--	--	--	--	--	--	--	1.4E+00	7.7E-01	--	--
Methyl Bromide	0	--	--	4 7E+01	1 5E+03	--	--	4 7E+01	1 5E+03	--	--	--	--	--	--	--	--	--	--	4.7E+01	1.5E+03
Methylene Chloride <sup>C</sup>	0	--	--	4 6E+01	5 9E+03	--	--	4 6E+01	5 9E+03	--	--	--	--	--	--	--	--	--	--	4.6E+01	5.9E+03
Methoxychlor	0	--	3 0E-02	1 0E+02	--	--	3 0E-02	1 0E+02	--	--	--	--	--	--	--	--	--	--	3.0E-02	1.0E+02	--
Mirex	0	--	0 0E+00	--	--	--	0 0E+00	--	--	--	--	--	--	--	--	--	--	--	0.0E+00	--	--
Nickel	0	1 0E+02	1 1E+01	6 1E+02	4 6E+03	1 0E+02	1 1E+01	6 1E+02	4 6E+03	--	--	--	--	--	--	--	--	1.0E+02	1.1E+01	6.1E+02	4.6E+03
Nitrate (as N)	0	--	--	1 0E+04	--	--	--	1 0E+04	--	--	--	--	--	--	--	--	--	--	--	1.0E+04	--
Nitrobenzene	0	--	--	1 7E+01	6 9E+02	--	--	1 7E+01	6 9E+02	--	--	--	--	--	--	--	--	--	--	1.7E+01	6.9E+02
N-Nitrosodimethylamine <sup>C</sup>	0	--	--	6 9E-03	3 0E+01	--	--	6 9E-03	3 0E+01	--	--	--	--	--	--	--	--	--	--	6.9E-03	3.0E+01
N-Nitrosodiphenylamine <sup>C</sup>	0	--	--	3 3E+01	6 0E+01	--	--	3 3E+01	6 0E+01	--	--	--	--	--	--	--	--	--	--	3 3E+01	6.0E+01
N-Nitrosodi-n-propylamine <sup>C</sup>	0	--	--	5 0E-02	5 1E+00	--	--	5 0E-02	5 1E+00	--	--	--	--	--	--	--	--	--	--	5.0E-02	5.1E+00
Nonylphenol	0	2 8E+01	6 6E+00	--	--	2 8E+01	6 6E+00	--	--	--	--	--	--	--	--	--	--	2.8E+01	6.6E+00	--	--
Parathion	0	6 5E-02	1 3E-02	--	--	6 5E-02	1 3E-02	--	--	--	--	--	--	--	--	--	--	6.5E-02	1.3E-02	--	--
PCB Total <sup>C</sup>	0	--	1 4E-02	6 4E-04	6 4E-04	--	1 4E-02	6 4E-04	6 4E-04	--	--	--	--	--	--	--	--	--	1.4E-02	6.4E-04	6.4E-04
Pentachlorophenol <sup>C</sup>	0	7 7E-03	5 9E-03	2 7E+00	3 0E+01	7 7E-03	5 9E-03	2 7E+00	3 0E+01	--	--	--	--	--	--	--	--	7.7E-03	5.9E-03	2.7E+00	3.0E+01
Phenol	0	--	--	1 0E+04	8 6E+05	--	--	1 0E+04	8 6E+05	--	--	--	--	--	--	--	--	--	--	1.0E+04	8.6E+05
Pyrene	0	--	--	8 3E+02	4 0E+03	--	--	8 3E+02	4 0E+03	--	--	--	--	--	--	--	--	--	--	8.3E+02	4.0E+03
Radionuclides Gross Alpha Activity (pCi/L)	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beta and Photon Activity (mrem/yr)	0	--	--	4 0E+00	--	--	--	4 0E+00	--	--	--	--	--	--	--	--	--	--	--	4.0E+00	--
Radium 226 + 228 (pCi/L)	0	--	--	5 0E+00	--	--	--	5 0E+00	--	--	--	--	--	--	--	--	--	--	--	5.0E+00	--
Uranium (ug/l)	0	--	--	3 0E+01	--	--	--	3 0E+01	--	--	--	--	--	--	--	--	--	--	--	3.0E+01	--



Parameter (ug/l unless noted)	Background Conc	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	2.0E+01	5.0E+00	1.7E+02	4.2E+03	--	--	--	--	--	--	--	--	2.0E+01	5.0E+00	1.7E+02	4.2E+03
Silver	0	1.0E+00	--	--	--	1.0E+00	--	--	--	--	--	--	--	--	--	--	--	1.0E+00	--	--	--
Sulfate	0	--	--	2.5E+05	--	--	--	2.5E+05	--	--	--	--	--	--	--	--	--	--	--	2.5E+05	--
1,1,2,2-Tetrachloroethane <sup>C</sup>	0	--	--	1.7E+00	4.0E+01	--	--	1.7E+00	4.0E+01	--	--	--	--	--	--	--	--	--	--	1.7E+00	4.0E+01
Tetrachloroethylene <sup>C</sup>	0	--	--	6.9E+00	3.3E+01	--	--	6.9E+00	3.3E+01	--	--	--	--	--	--	--	--	--	--	6.9E+00	3.3E+01
Thallium	0	--	--	2.4E-01	4.7E-01	--	--	2.4E-01	4.7E-01	--	--	--	--	--	--	--	--	--	--	2.4E-01	4.7E-01
Toluene	0	--	--	5.1E+02	6.0E+03	--	--	5.1E+02	6.0E+03	--	--	--	--	--	--	--	--	--	--	5.1E+02	6.0E+03
Total dissolved solids	0	--	--	5.0E+05	--	--	--	5.0E+05	--	--	--	--	--	--	--	--	--	--	--	5.0E+05	--
Toxaphene <sup>C</sup>	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	7.3E-01	2.0E-04	2.8E-03	2.8E-03	--	--	--	--	--	--	--	--	7.3E-01	2.0E-04	2.8E-03	2.8E-03
Tributyltin	0	4.6E-01	7.2E-02	--	--	4.6E-01	7.2E-02	--	--	--	--	--	--	--	--	--	--	4.6E-01	7.2E-02	--	--
1,2,4-Trichlorobenzene	0	--	--	3.5E+01	7.0E+01	--	--	3.5E+01	7.0E+01	--	--	--	--	--	--	--	--	--	--	3.5E+01	7.0E+01
1,1,2-Trichloroethane <sup>C</sup>	0	--	--	5.9E+00	1.6E+02	--	--	5.9E+00	1.6E+02	--	--	--	--	--	--	--	--	--	--	5.9E+00	1.6E+02
Trichloroethylene <sup>C</sup>	0	--	--	2.5E+01	3.0E+02	--	--	2.5E+01	3.0E+02	--	--	--	--	--	--	--	--	--	--	2.5E+01	3.0E+02
2,4,6-Trichlorophenol <sup>C</sup>	0	--	--	1.4E+01	2.4E+01	--	--	1.4E+01	2.4E+01	--	--	--	--	--	--	--	--	--	--	1.4E+01	2.4E+01
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	5.0E+01	--	--	--	5.0E+01	--	--	--	--	--	--	--	--	--	--	--	5.0E+01	--
Vinyl Chloride <sup>C</sup>	0	--	--	2.5E-01	2.4E+01	--	--	2.5E-01	2.4E+01	--	--	--	--	--	--	--	--	--	--	2.5E-01	2.4E+01
Zinc	0	6.5E+01	6.6E+01	7.4E+03	2.6E+04	6.5E+01	6.6E+01	7.4E+03	2.6E+04	--	--	--	--	--	--	--	--	6.5E+01	6.6E+01	7.4E+03	2.6E+04

#### Notes

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information  
Antidegradation WLAs are based upon a complete mix
- Antideg Baseline = (0.25(WQC - background conc) + background conc) for acute and chronic  
= (0.1(WQC - background conc) + background conc) for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 3Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 3Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix

Metal	Target Value (SSTV)	Note: do not use QL's lower than the minimum QL's provided in agency guidance
Antimony	5.6E+00	
Arsenic	1.0E+01	
Barium	2.0E+03	
Cadmium	3.9E-01	
Chromium III	2.5E+01	
Chromium VI	6.4E+00	
Copper	2.8E+00	
Iron	3.0E+02	
Lead	3.4E+00	
Manganese	5.0E+01	
Mercury	4.6E-01	
Nickel	6.8E+00	
Selenium	3.0E+00	
Silver	4.2E-01	
Zinc	2.6E+01	

## DMR QA/QC

Permit #:VA0067938

Facility:North Spring Behavioral Healthcare WWTP

Due	Parameter Description	QTY AVG	Lim Avg	QTY MAX	Lim Max	CONC MIN	Lim Min	CONC AVG	Lim Avg	CONC MAX	Lim Max
10-Oct-2011	pH	NULL	*****	NULL	*****	7.8	6	NULL	*****	8.3	9
10-Nov-2011	pH	NULL	*****	NULL	*****	7.6	6	NULL	*****	8.2	9
10-Dec-2011	pH	NULL	*****	NULL	*****	7.5	6	NULL	*****	8.3	9
10-Jan-2012	pH	NULL	*****	NULL	*****	7.4	6	NULL	*****	8.1	9
10-Feb-2012	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.5	9
10-Mar-2012	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.2	9
10-Apr-2012	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.3	9
10-May-2012	pH	NULL	*****	NULL	*****	7.6	6	NULL	*****	8.2	9
10-Jun-2012	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.4	9
10-Jul-2012	pH	NULL	*****	NULL	*****	7.5	6	NULL	*****	8.4	9
10-Aug-2012	pH	NULL	*****	NULL	*****	7.8	6	NULL	*****	8.3	9
10-Sep-2012	pH	NULL	*****	NULL	*****	7.6	6	NULL	*****	8.3	9
10-Oct-2012	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.4	9
10-Nov-2012	pH	NULL	*****	NULL	*****	7.8	6	NULL	*****	8.3	9
10-Dec-2012	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.3	9
10-Jan-2013	pH	NULL	*****	NULL	*****	7.6	6	NULL	*****	8.3	9
10-Feb-2013	pH	NULL	*****	NULL	*****	7.5	6	NULL	*****	8.4	9
10-Mar-2013	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.3	9
10-Apr-2013	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.4	9
10-May-2013	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.8	9
10-Jun-2013	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.5	9
10-Jul-2013	pH	NULL	*****	NULL	*****	7.6	6	NULL	*****	8.2	9
10-Aug-2013	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.1	9
10-Sep-2013	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.3	9
10-Oct-2013	pH	NULL	*****	NULL	*****	7.8	6	NULL	*****	8.3	9
10-Nov-2013	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.4	9
10-Dec-2013	pH	NULL	*****	NULL	*****	7.5	6	NULL	*****	8.3	9
10-Jan-2014	pH	NULL	*****	NULL	*****	7.5	6	NULL	*****	8	9
10-Feb-2014	pH	NULL	*****	NULL	*****	7.5	6	NULL	*****	8.3	9
10-Mar-2014	pH	NULL	*****	NULL	*****	7.5	6	NULL	*****	8.1	9
10-Apr-2014	pH	NULL	*****	NULL	*****	7.5	6	NULL	*****	8	9
10-May-2014	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.2	9
10-Jun-2014	pH	NULL	*****	NULL	*****	7.7	6	NULL	*****	8.3	9
10-Jul-2014	pH	NULL	*****	NULL	*****	7.6	6	NULL	*****	8.8	9

10-Aug-2014	pH	NULL	*****	NULL	*****	7.1	6	NULL	*****	8.2	9
10-Sep-2014	pH	NULL	*****	NULL	*****	6.8	6	NULL	*****	8	9
10-Oct-2014	pH	NULL	*****	NULL	*****	6.8	6	NULL	*****	8	9
10-Nov-2014	pH	NULL	*****	NULL	*****	6.3	6	NULL	*****	8.1	9
10-Dec-2014	pH	NULL	*****	NULL	*****	6.7	6	NULL	*****	8	9
10-Jan-2015	pH	NULL	*****	NULL	*****	6.6	6	NULL	*****	8.1	9
10-Feb-2015	pH	NULL	*****	NULL	*****	6.7	6	NULL	*****	7.9	9
10-Mar-2015	pH	NULL	*****	NULL	*****	6.6	6	NULL	*****	7.9	9
10-Apr-2015	pH	NULL	*****	NULL	*****	6.96	6	NULL	*****	8.08	9
10-May-2015	pH	NULL	*****	NULL	*****	7.49	6	NULL	*****	8.11	9
10-Jun-2015	pH	NULL	*****	NULL	*****	6.97	6	NULL	*****	8.56	9
10-Jul-2015	pH	NULL	*****	NULL	*****	7.02	6	NULL	*****	8.46	9
10-Aug-2015	pH	NULL	*****	NULL	*****	6.64	6	NULL	*****	8.5	9
10-Sep-2015	pH	NULL	*****	NULL	*****	7.23	6	NULL	*****	8.34	9
10-Oct-2015	pH	NULL	*****	NULL	*****	7.62	6	NULL	*****	7.98	9
10-Nov-2015	pH	NULL	*****	NULL	*****	7.43	6	NULL	*****	8.55	9
10-Dec-2015	pH	NULL	*****	NULL	*****	7.38	6	NULL	*****	8.62	9
10-Jan-2016	pH	NULL	*****	NULL	*****	7.13	6	NULL	*****	7.76	9
10-Feb-2016	pH	NULL	*****	NULL	*****	7.04	6	NULL	*****	7.67	9
10-Mar-2016	pH	NULL	*****	NULL	*****	7.05	6	NULL	*****	7.82	9

All reported pH data:

90th percentile: 8.7  
10th percentile: 7.0

4/21/2016 1:17:46 PM

Facility = North Springs Behavioral Health

Chemical = Ammonia

Chronic averaging period = 30

WLAa = 3.9

WLAc = 0.66

Q.L. = .2

# samples/mo. = 1

# samples/wk. = 1

#### Summary of Statistics:

# observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

# < Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 1.33166226165477

Average Weekly limit = 1.33166226165477

Average Monthly Limit = 1.33166226165477

The data are:

3/15/2010 10:23:06 AM

Facility = North Spring Behavioral Healthcare WWTP

Chemical = Ammonia

Chronic averaging period = 30

WLAa = 3.9 mg/l

WLAc = 0.66 mg/l

Q.L. = 0.2

# samples/mo. = 1

# samples/wk. = 1

#### Summary of Statistics:

# observations = 1

Expected Value = 9

Variance = 29.16

C.V. = 0.6

97th percentile daily values = 21.9007

97th percentile 4 day average = 14.9741

97th percentile 30 day average = 10.8544

# < Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 1.33166226165477

Average Weekly limit = 1.33166226165477

Average Monthly Limit = 1.33166226165477

The data are:

6/1/2016 9:17:51 AM

Facility = North Spring Behavioral Health

Chemical = TRC

Chronic averaging period = 4

WLAa = 0.019

WLAc = 0.011

Q.L. = 0.1

# samples/mo. = 30

# samples/wk. = 8

#### Summary of Statistics:

# observations = 1

Expected Value = .2

Variance = .0144

C.V. = 0.6

97th percentile daily values = .486683

97th percentile 4 day average = .332758

97th percentile 30 day average = .241210

# < Q.L. = 0

Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity

Maximum Daily Limit = 1.60883226245855E-02

Average Weekly limit = 9.59676626920106E-03

Average Monthly Limit = 7.9737131838758E-03

The data are:

0.2

REGIONAL MODELING SYSTEM VERSION 4.0  
Model Input File for the Discharge  
to UT, LIMESTONE BRANCH.

**File Information**

File Name: I:\sdmackert\North Spring WWTP Run 2.mod  
Date Modified: January 27, 2010

**Water Quality Standards Information**

Stream Name: UT, LIMESTONE BRANCH  
River Basin: Potomac/Shenandoah Rivers Basin  
Section: 8  
Class: III - Nontidal Waters (Coastal and Piedmont)  
Special Standards: PWS

**Background Flow Information**

Gauge Used: USGS Gauge at Catocin Creek  
Gauge Drainage Area: 89.6 Sq.Mi.  
Gauge 7Q10 Flow: 0.71 MGD  
Headwater Drainage Area: 3.65 Sq.Mi.  
Headwater 7Q10 Flow: 2.892299E-02 MGD (Net; includes Withdrawals/Discharges)  
Withdrawal/Discharges: 0 MGD  
Incremental Flow in Segments: 7.924107E-03 MGD/Sq.Mi.

**Background Water Quality**

Background Temperature: 25 Degrees C  
Background cBOD5: 2 mg/l  
Background TKN: 0 mg/l  
Background D.O.: 7.436029 mg/l

**Model Segmentation**

Number of Segments: 1  
Model Start Elevation: 250 ft above MSL  
Model End Elevation: 237 ft above MSL

REGIONAL MODELING SYSTEM    VERSION 4.0  
**Model Input File for the Discharge  
to UT, LIMESTONE BRANCH.**

**Segment Information for Segment 1**

Definition Information

Segment Definition:	A discharge enters.
Discharge Name:	NORTH SPRING BEHAVIORAL HEALTHCARE WWTP
VPDES Permit No.:	

Discharger Flow Information

Flow:	0.016 MGD
cBOD5:	15 mg/l
TKN:	5 mg/l
D.O.:	6.5 mg/l
Temperature:	25 Degrees C

Geographic Information

Segment Length:	0.91 miles
Upstream Drainage Area:	3.65 Sq.Mi.
Downstream Drainage Area:	0 Sq.Mi.
Upstream Elevation:	250 Ft.
Downstream Elevation:	237 Ft.

Hydraulic Information

Segment Width:	4 Ft.
Segment Depth:	0.098 Ft.
Segment Velocity:	0.177 Ft./Sec.
Segment Flow:	0.045 MGD
Incremental Flow:	-0.029 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Rectangular
Character:	Mostly Straight
Pool and Riffle:	No
Bottom Type:	Gravel
Sludge:	None
Plants:	None
Algae:	None



modout.txt

"Model Run For I:\sdmackert\North Spring WWTP Run 2.mod On 1/27/2010 2:26:45 PM"

"Model is for UT, LIMESTONE BRANCH."

"Model starts at the NORTH SPRING BEHAVIORAL HEALTHCARE WWTP discharge."

"Background Data"

"7Q10"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.0289,	2,	0,	7.436,	25

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.016,	15,	5,	6.5,	25

"Hydraulic Information for Segment 1"

"Length"	"width"	"Depth"	"velocity"
"(mi)"	"(ft)"	"(ft)"	"(ft/sec)"
.91,	4,	.098,	.177

"Initial Mix Values for Segment 1"

"Flow"	"DO"	"cBOD"	"nBOD"	"DOSat"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.0449,	7.103,	16.575,	3.084,	8.264,	25

"Rate Constants for Segment 1. - (All units Per Day)"

"k1"	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
1.2,	1.51,	8.571,	9.651,	.4,	.588,	0,	0

"Output for Segment 1"

"Segment starts at NORTH SPRING BEHAVIORAL HEALTHCARE WWTP"

"Total"	"Segm."	"Dist."	"Dist."	"DO"	"cBOD"	"nBOD"
"(mi)"	"(mi)"	"(mi)"	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
0,	0,	7.103,	16.575,	3.084		
.1,	.1,	6.664,	15.733,	3.022		
.2,	.2,	6.387,	14.934,	2.961		
.3,	.3,	6.224,	14.175,	2.902		
.4,	.4,	6.141,	13.455,	2.844		
.5,	.5,	6.114,	12.772,	2.787		
.6,	.6,	6.125,	12.123,	2.731		
.7,	.7,	6.162,	11.507,	2.676		
.8,	.8,	6.216,	10.923,	2.622		
.9,	.9,	6.28,	10.368,	2.569		
.91,	.91,	6.287,	10.314,	2.564		

"END OF FILE"

## Public Notice – Environmental Permit

**PURPOSE OF NOTICE:** To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Loudoun County, Virginia.

**PUBLIC COMMENT PERIOD:** June 29, 2016 – July 29, 2016

**PERMIT NAME:** Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board.

**APPLICANT NAME, ADDRESS AND PERMIT NUMBER:** North Spring Behavioral Healthcare  
42009 Victory Lane  
Leesburg, VA 20176  
VA0067938

**NAME AND ADDRESS OF FACILITY:** North Spring Behavioral Healthcare  
42009 Victory Lane  
Leesburg, VA 20176

**PROJECT DESCRIPTION:** North Spring Behavioral Healthcare has applied for reissuance of a permit for the private North Spring Behavioral Healthcare Sewage Treatment Plant. The applicant proposes to release treated sewage wastewaters from this facility at a rate of 0.016 million gallons per day into an unnamed tributary of Limestone Branch in Loudoun County in the Potomac and Shenandoah River Watershed. A watershed is the land area drained by a river and its incoming streams. Sludge generated from the treatment process will be transported to Broad Run WRF (VA0091383) for stabilization and subsequent disposal via land application or placement in a landfill. The permit will limit the following pollutants to amounts that protect water quality: pH, Biochemical Oxygen Demand-5 day, Total Suspended Solids, Dissolved Oxygen, Ammonia as Nitrogen, Total Residual Chlorine, and *E. coli* Bacteria. Additionally, the permit shall require monitoring for flow, Nitrite+Nitrate as Nitrogen, Total Kjeldahl Nitrogen, Total Nitrogen, and Total Phosphorus.

**HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING:** DEQ accepts comments and requests for public hearing by hand-delivery or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

**CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION:** The public may review the draft permit and application at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.

Name: Anna T. Westernik

Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193

Phone: (703) 583-3837 E-mail: [anna.westernik@deq.virginia.gov](mailto:anna.westernik@deq.virginia.gov)

## ENFORCEMENT CASE CLOSURE MEMORANDUM

**Region:** NRO

**Date:** \_8/17/2011\_

**Facility/Source:** North Springs Behavioral Health Center WWTP VEEP? ☐ **Level:** \_\_\_\_

**Location:** Leesburg, VA

**Resp. Party/Fac. Owner:** Loudoun Water

**EA No.:** NR10-0113

*ECM File No.*

**Permit No. (or Registration No.):** VA0067938

**[PC/IR No.:** \_\_\_\_\_]

*ECM Case ID (or ECM Facility No.)*

**Media Program:** \_Water

**HPV/SNC?** ☐

**Referring NOV date:** 1/14/2010    **Order/ECA/LOA Date [if any]** \_\_\_\_\_

**Case Summary:** *[include information on RTC, where applicable]*

Loudoun Water was referred to enforcement in January 2010, for failing to submit an adequate plan for ensuring continued compliance with the terms of the permit when the facility reached 95% of its design capacity. On January 15, 2010, Loudoun submitted a permit application requesting a modification of the permit to re-rate the plant to a higher flow. On August 4, 2011, DEQ issued a revised permit reflecting a higher flow rating for the facility. As the facility is now no longer at 95% of its design capacity, no further enforcement action is warranted.

### **Return-to-Compliance Closure:**

- ☒ Compliance achieved through informal action **8/4/2011**; order not required or appropriate (include discussion in Case Summary).
- ☐ Letter of Agreement issued **[date]**. All terms complied with.
- ☐ Consent Order/ECA issued **[date]**. All terms complied with.
- ☐ APA Order issued **[date]**. All terms complied with.
- ☐ OAG or EPA action issued **[date]**. All terms complied with.

### **Administrative Closure/Dereferral (use checkbox and include Justification)**

- ☐ RP has ceased continuing, non-compliant activities, and no enforcement action will lead to further compliance or payment of an appropriate civil charge.
- ☐ Facility has closed permanently, and DEQ is unable to pursue enforcement.
- ☐ There are no liable, viable or identifiable parties to take an enforcement action against.

- ☐ No administrative enforcement actions have or will result in compliance, and judicial enforcement is not appropriate.
- ☐ Upon further investigation, there is not sufficient evidence to pursue the alleged violation(s) in an enforcement action.
- ☐ Other

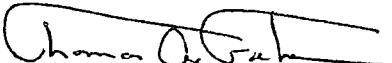
**Justification for Administrative Closure/Dereferral:**

**Recommended by:** Sarah Baker Regional Enforcement Manager 8/17/2011  
Name Title Date

**Concurrence (initial and date):**

Enforcement Manager: SB Date 8/17/11 DE: \_\_\_\_\_ Date \_\_\_\_\_  
[initials, email, or ECM]  
[for Adm. Closure/Dereferral only]

**Approved:**

 Date: 8.22.11  
Regional Director [or Deputy Regional Director]

**Comments:**

**Attachment(s)**

**Copies:** Regional Compliance/Permits Manager  
Division of Enforcement [for Admin. Closure or termination of Order or ECA]